

FEBRUARY • 1960

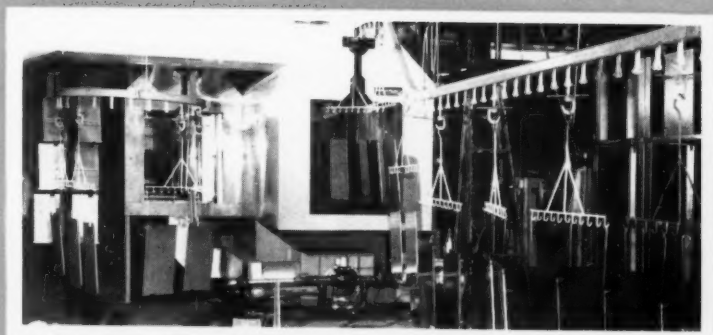
Metal Products Manufacturing

*Serving the
Appliance and
Fabricated Metal Products
Industry*

New Appliances for 1960 — Starting on Page 41



The Coated Steels — Page 27



Modernized Finishing and Assembly Facilities at Armstrong — Page 31

119

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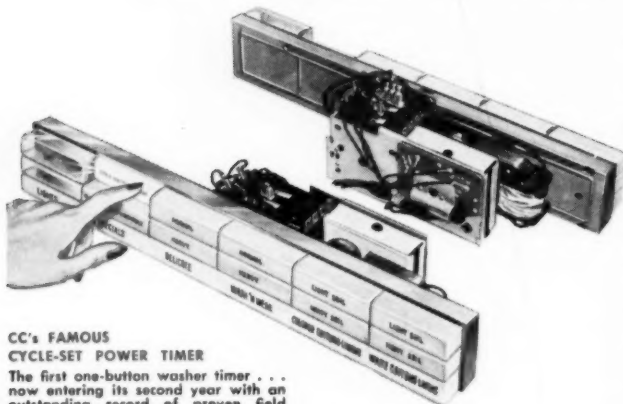
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TECHNOLOGY
DEPARTMENT

Sm

Every appliance made today can be controlled just a little bit better with... CONTROLS



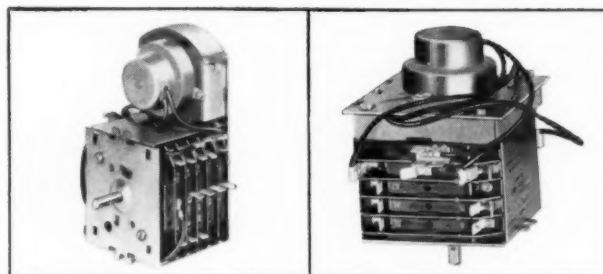
CC's FAMOUS CYCLE-SET POWER TIMER

The first one-button washer timer... now entering its second year with an outstanding record of proven field performance! Amazingly low record of service attention.






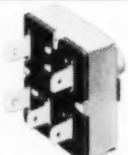


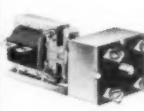
Individual components or completely integrated systems. Whichever you choose, you can be sure of this: Controls Company products are function-mated to the appliances they control. Field records show this results in extra value that helps sell the end-product... *and keep it sold!*

Shown here are some of the CC controls now helping to make many appliance lines just a little bit better than competition. Write for facts about these and other CC controls.



LATERAL TIMERS — Just 2-17/32" deep. For washers, dryers, combinations dishwashers, other automatic equipment.

TANDEM TIMERS — Drive mechanism to rear of switch case for "tight-squeeze" installation in automatic equipment.

 <p>SOLENOIDS — Exclusive double T-plunger means more pull for more applications. Four types, twelve models.</p>	 <p>SNAPAC SWITCHES — 750 Series (shown) for limit, safety interlocking, door and control switch needs.</p>	 <p>PRESSURE SWITCHES — Single and multi-level pressure. Designed to control liquid levels.</p>	 <p>ROTARY SWITCHES — Compact 777 Series (shown) ideal for appliances, vending machines.</p>	 <p>SYNCHRONOUS MOTORS — offer eleven speeds, three shaft types, two lube systems.</p>	 <p>INTERVAL TIMERS — Type 105 (shown) for preset appliance time control.</p>	 <p>SOLENOID OPERATED SWITCHES — Type 12270 makes, breaks two circuits simultaneously.</p>
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Creative Controls for Industry
CONTROLS COMPANY OF AMERICA

APPLIANCE AND AUTOMOTIVE CONTROLS DIVISION

9559 Soreng Ave., Schiller Park, Ill. • Cookville, Ontario

Here's a special Armco metal that's made for porcelain enameling

New steels are
born at
Armco



That's why Armco Enameling Iron is "standard" for high quality finishes

1. **Resists sag**—Armco Enameling Iron stubbornly holds its shape at *all* porcelain enamel firing temperatures. Critical dimensions stay accurate.
2. **Commercially pure**—This special enameling base contains a strict minimum of carbon and gas-forming inclusions. Finish defects stay low.
3. **Surface grips enamel**—The slightly-roughened surface of Armco Enameling Iron promotes even flow of slip and a tight porcelain-metal bond develops during firing.

Few rejects—more sales

Perfect fit and flawless finish are easier to achieve when parts are made from Armco Enameling Iron. This holds down costly rejects. It also means more sales appeal for clothes washers, dishwashers, ranges, refrigerators, and other products that receive critical customer inspection.

For complete information on Armco Enameling Iron, just write Armco Steel Corporation, 1140 Curtis Street, Middletown, Ohio.

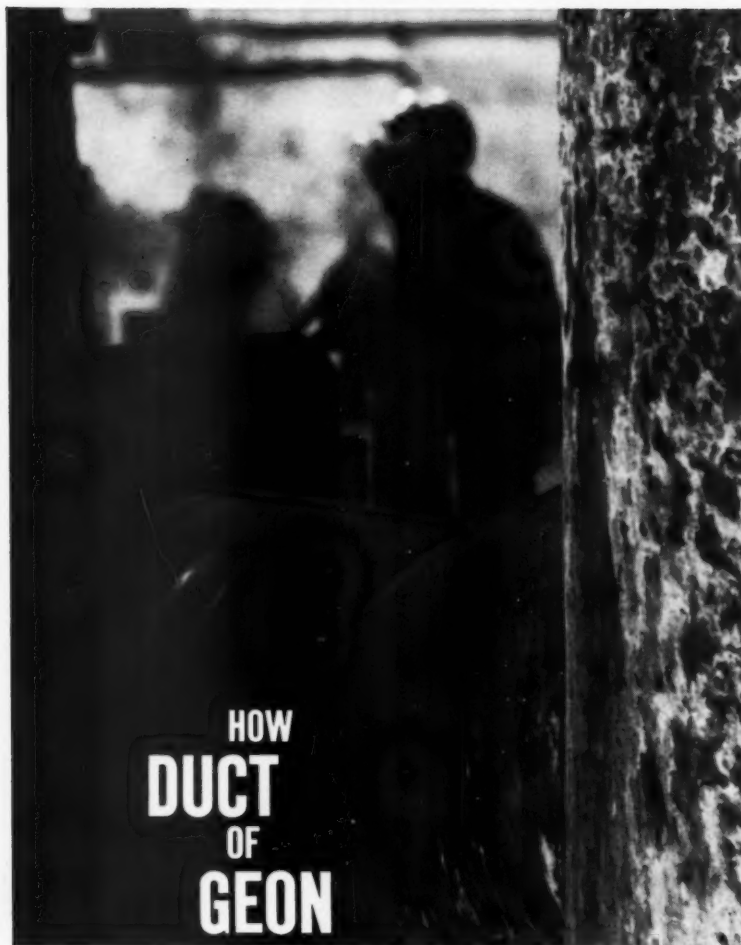
ARMCO STEEL



Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation

Another new development using

B.F. Goodrich Chemical raw materials



HOW
DUCT
OF
GEON

The large duct shown here was fabricated of Geon vinyl by Colonial Plastics Mfg. Co. through their distributor, Gould-Kramer, Inc., Cleveland, Ohio. B.F. Goodrich Chemical Company supplied the Geon vinyl.



CONQUERS CORROSION IN CHLORINATION ROOM

A tougher corrosion problem than this one would be hard to find. That's why all the large round duct you see is fabricated from rigid sheet made of Geon vinyl.

This room is where spent gases are carried from chlorinating operations to storage tanks. The atmosphere is such that personnel must wear goggles and face masks at all times. Corrosion would make short work of most ductwork or pipe.

But Geon is unaffected by acids, oils or many hydrocarbon chemicals. It is easy to fabricate, light in weight,

and simple to install. Duct, pipe—even complete fans and valves—made of Geon are solving corrosion problems throughout industry.

For more information on products made of Geon vinyl—or on this versatile material itself—write Dept. GD-1, B.F. Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.



B.F. Goodrich Chemical Company
a division of The B.F. Goodrich Company



GEON vinyls • HYCAR rubber and latex • GOOD-RITE chemicals and plasticizers

MPM

(including finish)

MONTHLY TRADE PUBLICATION

Established January 1944

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FEBRUARY • 1960

VOL. 17 • NO 2

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METAL PRODUCTS MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is \$8.00 per year, domestic. To all other countries \$10.00 per year (U.S. funds). Single copies, \$1.00.

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THE MPM
spotlight



"On-A-Wall" water cooler by Ebco Mfg. Co. features a brown Scandia pattern plastic vinyl laminate finish on 20 gauge steel; removable front panel and grille; polished stainless steel top with anti-splash ridge; Dial-A-Drink bubbler, and provision for glass filler. The unit is available in both seven and 13 gallon capacities, and can be mounted directly to the wall at any height.

NEW HOTPOINT DISHWASHER FEATURES COMBINATION LATCH-CONTROL BY

Amerock

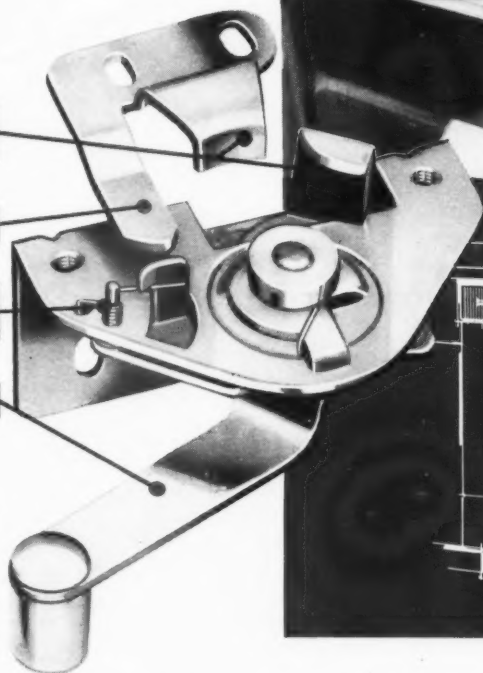
Amerock sash lock cam-operated principle applies sealing pressure to door.

Strike releases stop . . . allows circuit to be closed.

Spring-activated stop prevents operating machine until door is tightly closed.

Single control seals door, activates on-off switch.

**Amerock window
hardware
experience helps
solve problem
for Hotpoint**



Top: Dishwasher door open—master switch OFF.
Below: Door tightly sealed—master switch ON.

Experience gained in the manufacture of hardware for completely unrelated products can often be put to use by imaginative engineers to solve difficult problems for manufacturers in other fields.

This proved to be the case when Hotpoint asked Amerock for a special latch that would also serve as the master ON-OFF switch for their dishwasher.

Taking their lead from Hotpoint designers, Amerock engineers called upon their experience with cam-operated window locks to produce a latch that tightly closes the dishwasher door as it locks. This effectively seals the door to prevent water from escaping when the machine is in operation.

Hotpoint also required the latch to serve as a master ON-OFF control so that the machine cannot be started while the door is open. This problem was solved by the development of a spring-actuated stop that prevents the latch from being closed until the door is completely shut. The stop is then released automatically so the latch can be closed, allowing the dishwasher to operate.

All Hotpoint requirements were met satisfactorily, tools were produced in Amerock's plant and the complete mechanism is now being supplied by Amerock for Hotpoint.

Why not take advantage of Amerock's experienced design and production personnel when you need hardware for your products? Write for Amerock's complete IDEA FILE or have an Amerock sales engineer call on you at your convenience . . . there is no obligation, of course.

AMEROCK CORPORATION

Industrial Sales, Dept. MP20, Rockford, Ill.

☐ Please send me your 1960 IDEA FILE.

☐ I would like to explore Design Service on hardware for _____

☐ Have representative call.

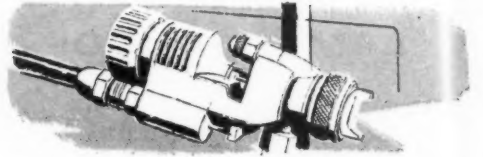
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Company _____

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for your products



that offers the entire package:
for equipment (2) an unbiased

the method best suited to your
research,

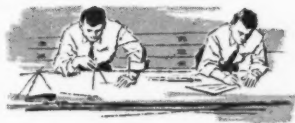


engineering,

Three words say it:

DeVilbiss

Put it to work for you now!

the most satisfactory finishes
is to consult the only company
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training--to insure job success.

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Hot-spray systems Airless spray equipment Portable spray outfits
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FOR TOTAL SERVICE, CALL

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*For smoother,
easier drawing
and forming*

ask Oakite

OVER 50 YEARS CLEANING EXPERIENCE • OVER 250 FIELD SERVICE MEN • OVER 160 MATERIALS



Oakite DRAW CLEAN "M" cuts forming rejects, lengthens tool and die life, washes off fast

New Oakite Draw Clean "M" lubricant smoothes the way for lower reject rates on drawing and forming steel, aluminum, copper and brass. How? Draw Clean "M" clings to metal with such tenacity that pressures of 40 thousand psi cannot wipe it off. Even the thinnest film will prevent seizure that causes build-up, galling and scratching.

The components of Draw Clean "M" are soluble and, at annealing temperatures volatile. This is important to you because while it clings where most other compounds wipe away—it can be removed easily in a mild detergent solution. Yet the residue, if allowed to remain, is not harmful to metal or man.

By diluting with water in ratios as high as 1 to 9 Oakite Draw Clean "M" offers astonishing per-unit cost savings. It extends die life three times the previous experience. Miscible with both water

and oil it may be adapted to any of the following:

light stamping	stretch forming	spinning
deep drawing	tube bending	punching
cold heading	tapping	wet grinding

Ask your Oakite man for bulletin F-10393 or write Oakite Products, Inc., 26H Rector Street, New York 6, N. Y.

it PAYS to ask Oakite





Metals pre-coated with SUPERCLAD or KEMCLAD may be stamped, punched, brake-formed, die-formed, roll-formed and assembled in many forms without damage to the finish. Ask for help on your products.



These coatings for PRE-FINISHING your products have been exposure-proved for more than 14 years

CAN YOU AFFORD LESS?

Some of the many ways pre-coated metals can save you money may be unknown—but the performance you can expect from the coatings need not be.

Sherwin-Williams SUPERCLAD and KEMCLAD Enamels for the pre-finishing of continuous metal strip have been exposure-proved on exterior and interior applications for as long as 14 years. First in the field of finishes for aluminum house-siding, awnings, Venetian blinds and many other related products, Sherwin-Williams offers products backed by complete field performance records and experience.

More than 1,000,000 aluminum-siding homes in all sections of the country, pre-finished with Sherwin-Williams SUPERCLAD and KEMCLAD materials, are evidence of this background.

Specify Sherwin-Williams and be sure, on the coated metals you use or the coatings you buy. If you don't pre-coat or use pre-coated metals—better investigate! The Sherwin-Williams Co., General Industrial Division, Cleveland, Ohio. In Canada: 2875 Centre St., Montreal.



SHERWIN-WILLIAMS / INDUSTRIAL FINISHES

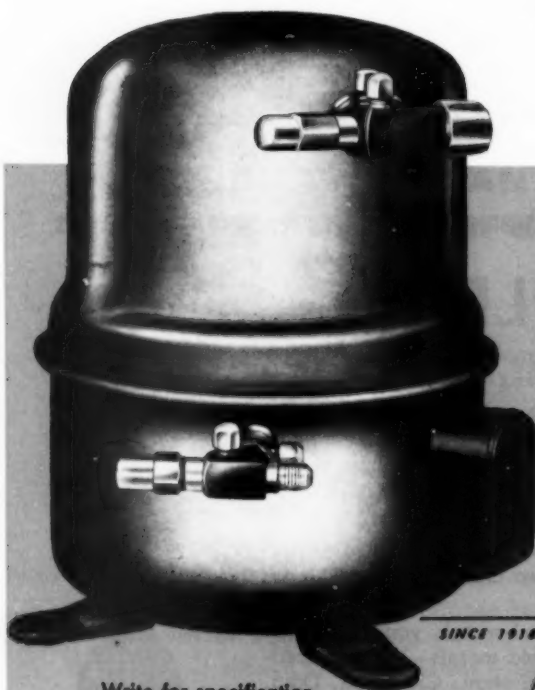
Higher capacities compact size... 1750 R.P.M....

4-pole... 4-cylinder... minimum space requirements
... internal spring mounting for quiet,
vibration-free operation... $2\frac{1}{2}$, 3, $3\frac{1}{2}$ and 4 H.P.
... inherent motor-protector internally
mounted, hermetically sealed... statically
and dynamically balanced crankshaft... positive
displacement gear oil pump, automatic
reversing... heavy duty motor...

NEW COPELAWELD welded
hermetics pack more value into
packaged air conditioners
and heat pumps

A good product can be made even better with the new Copelaweld "4U" series of welded hermetics. They enable you to build more cooling into smaller packages... offer top operating efficiency along with Copeland dependability.

Your products deserve the best. Be sure to give serious consideration to the new Copelaweld "4U" series.



Write for specification
sheet number 5909

PERFORMANCE DATA

Model	Capacity* B.T.U./Hr.	Full Load Amps.	Locked Rotor Amps.
4U16-252	29,400	13.6	70
4U18-302	32,800	17.9	70
4U22-352	39,400	21.4	126
4U26-402	45,000	27.8	126

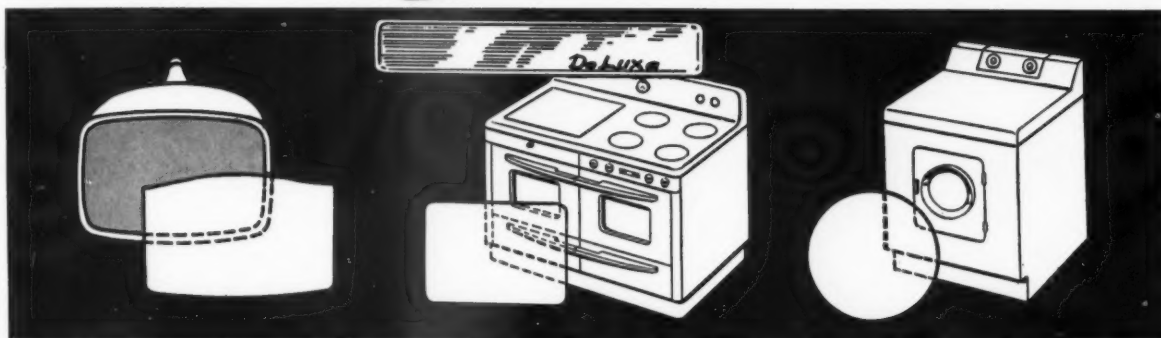
*Capacity based on A.S.R.E. rating conditions:
Evaporating Temperature 45 F.; Condensing Temperature 130 F.
Section Gas Temperature 65 F.; No liquid sub-cooling.

SINCE 1918

Copeland
REFRIGERATION CORPORATION, Sidney, Ohio

MARSCO

Glass



for TELEVISION • MODERN RANGES • WASHING MACHINES

Let MARSCO'S Craftsmen-Engineering Team

IMPART TO YOUR PRODUCT ALL THE ADVANTAGES OF GLASS

Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:

- CLOCK & TIMER CRYSTALS
- OVEN DOORS
- RADAR EQUIPMENT
- AIRCRAFT ACCESSORIES
- PHOTOGRAPHIC EQUIPMENT
- LIGHT LENSES
- DIALS & NAME PLATES
- TELEVISION EQUIPMENT
- INSTRUMENTS
- MEDICAL EQUIPMENT
- BACKGUARD GLASS FOR RANGES
- LAMP GLASS
- SHELVING

Special Shapes for: Instruments, Gauges, Household and Industrial Appliances.

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Bent Glass

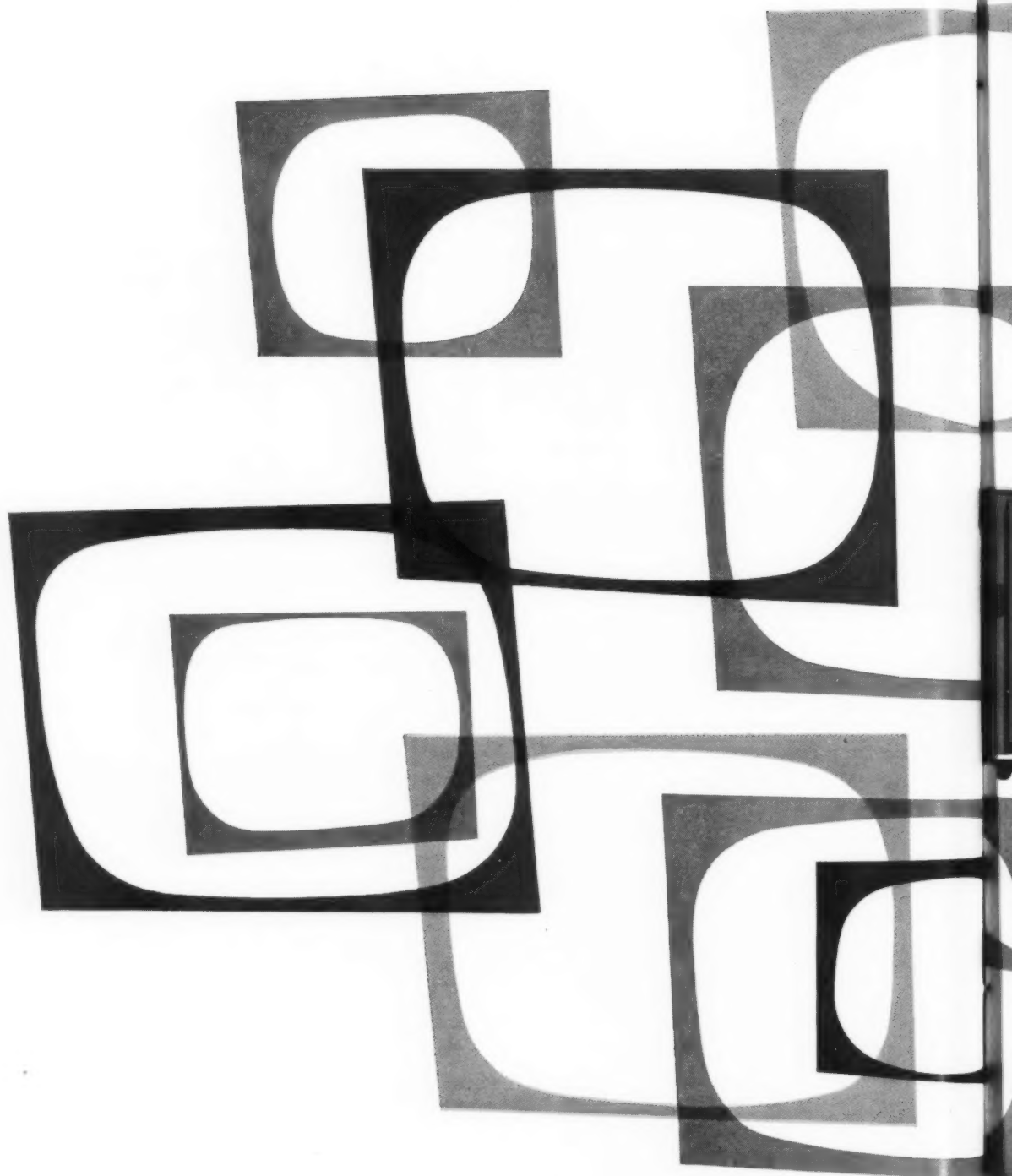


Convex Glass



Heat-treated Glass

MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.



Weirton Steel is a division of **NATIONAL STEEL CORPORATION**



Better products through better methods and steels

How zinc-coated steels improve the profit picture in TV-set manufacturing

Solid savings in TV manufacturing often come in small ways.

Take the case of the TV masks once made of cold-rolled steel and painted on both sides to stave off corrosion.

When the switch was made to Weirzin electrolytic zinc-coated steel, protective painting bowed out. Because

Weirzin's uniform, corrosion-resistant surface is impervious to heat and humidity, the mask's interior is left as is. The exterior is painted purely for decoration—and with Grade A results since Weirzin comes chemically treated to provide a superior bonding surface for paint.

Weirzin electrolytic zinc-coated steel is but one of many fine steels produced by Weirton Steel Company—improving products, methods *and* profits throughout industry.



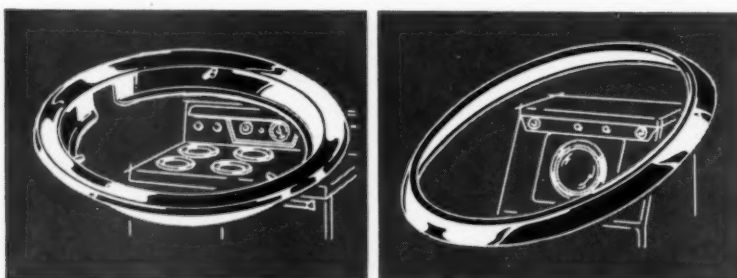
WEIRTON STEEL

Weirton, West Virginia



From simple tee mouldings for joining backguard panels... to sturdy frames for built-ins—necessary parts become decorative parts when made in gleaming stainless steel by Pyramid.

Over thirty years of experience gives assurance that Pyramid Trim fills the function while adding the ultimate in sparkling, eye-catching sales appeal to your products. Write today for complete details on Pyramid's many standard or special shapes that can add definite glamour to parts you need.



Pyramid glistening stainless steel rings "dress up" today's best selling appliances. Roll-formed from endless spirals, Pyramid rings cut costs by eliminating waste.

Pyramid Mouldings Inc.

5365 WEST ARMSTRONG AVE., CHICAGO 46, ILL.
UPLAND, CALIFORNIA BRONXVILLE, NEW YORK



from the Editor's Mail

The "buck" stops here

Gentlemen: As recently as the December, 1959 issue of METAL PRODUCTS MANUFACTURING, announcement was made of an activity of the Porcelain Enamel Institute. We called our local library to get an address of the Institute, as we wished to obtain a test standard issued by the Institute. The address the library gave us was 1010 Vermont Ave., Washington 5, D. C. This address was not correct as our letter was forwarded to 1346 Connecticut Ave., (also not correct), so our letter was returned to us.

Can you suggest whom we might contact to obtain the following: Porcelain Enamel Institute—"Test for adherence of porcelain enamel to sheet metal"—Bulletin T-17.

Any assistance you might be able to give in this matter would be greatly appreciated.

Rita A. Maguire, Librarian
Lamp Division, Engineering Library
Westinghouse Electric Corp.
Bloomfield, N. J.

The correct address is: Porcelain Enamel Institute, Associations Building, 1145 Nineteenth St., N. W., Washington 6, D. C.

The Editors

Enamelstrip article of interest to many readers

Gentlemen: We would very much like to have tear sheets of the following article if they are available: "Coating coil steel in 48-inch width," (an MPM staff feature), METAL PRODUCTS MANUFACTURING, Pages 54-58, November, 1959.

Roberta F. Denson, Asst. Librarian
Interchemical Corp.
The Research Laboratories
New York, N. Y.

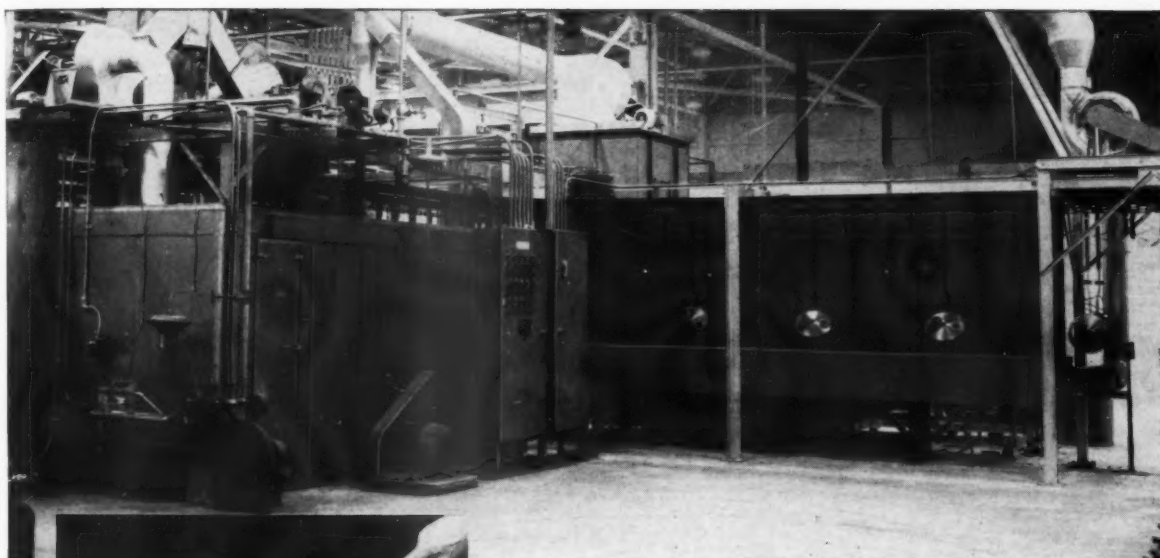
Gentlemen: We would very much like another copy of an article appearing in your November, 1959 issue of METAL PRODUCTS MANUFACTURING entitled "Coating coil steel in 48-inch width." Please send it to the address listed.

L. G. Brotzman, President
Western Metal Decorating Co.
Cucamonga Div.
Cucamonga, Calif.

Gentlemen: Will you kindly forward to us twelve reprints of the article, "Coating coil steel in 48-inch width," which appeared in the November, 1959 issue of METAL PRODUCTS MANUFACTURING.

If there is a charge for these reprints, we will be glad to remit promptly.

George J. Holub
Assistant Manager of Advertising
The Yoder Co., Cleveland, Ohio
to Page 21 →



JOB REPORT

PRODUCT:

Stamped steel covers and structural components for high-voltage Westinghouse transformers. Coated with CORVEL cellulasic to provide 12000 volts insulation, a gasketless seal, and a durable, decorative weather proof surface.

PROCESS:

Preheat parts, dip in "fluidized" bed of fine, dry plastic powder, and postheat. Oven temperatures held to plus or minus 5°F. Licensed fluidized bed process deposits tough, corrosion-resistant coating of uniform thickness on all surfaces, regardless of part configuration.

PRODUCTION:

Uninterrupted production of finish-coated parts from conveyorized installation of preheating ovens, dipping tanks, excess powder blow-off and collection units, and postheating ovens—custom engineered, fabricated and erected by MOCO for economical operation by Westinghouse Electric Corporation.

Trademark of The Polymer Corporation for finishing materials.

MOCO, the Polymer Corporation and Westinghouse Team-up to Beat the Elements!

Teaming up to take advantage of the unique new fluidized bed coating process, Michigan Oven Company, The Polymer Corporation and Westinghouse Electric Corporation engineers recently completed target-date installation of a system for applying CORVEL* fusion bond coatings at a modern new Westinghouse manufacturing center.

Designed to apply a protective coating on transformer covers, the new system demanded accurate timing and temperature control of parts during pre-heating and post-heating, complete scavenging of excess powder (for general safety reasons as well as economic ones), and continuous movement of parts in a specified path for uniform dip-coating.

Experienced MOCO design and process engineers provided an integrated system of ducts, blowers, conveyors, and heating and control equipment completely meeting Westinghouse specifications for quantity, quality and cost.

MOCO problem-solvers will welcome the opportunity to team their talents with yours. Write for the name of our representative nearest you.

FREE—Send for your MOCO bulletin showing typical finishing system applications and specifications; no cost or obligation, of course.



MICHIGAN OVEN COMPANY



FINISHING EQUIPMENT DEPT.
423 BRAINARD
DETROIT 1, MICHIGAN

Washing Machines • Bonderizing Units • Dry-off Ovens
Dip Tanks • Spray Booths • Flo-coaters • Finishing Ovens • Conveyors



In Pemco's continuing search for better ceramic finishes, the answers start in the minds of men. The seed of an idea, often planted during casual reflection, is fed by the experience of 50 years and brought to fruition under practical laboratory and field testing procedures. At Pemco, the pattern is progress . . . **always** worth thinking about.



50 YEARS OF RESEARCH AND A FLAME

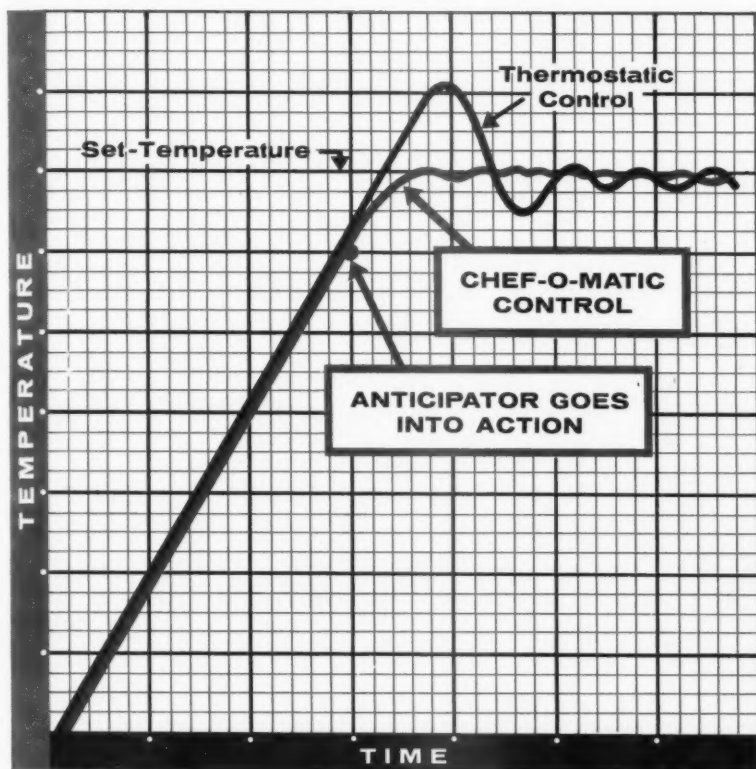
PEMCO

BALTIMORE 24, MARYLAND

CERAMIC FRITS, INORGANIC PIGMENTS, VITRIFIABLE GLASS COLORS

The CHEF-O-MATIC THINKS AHEAD

for Closer Surface Element Temperature Control



Unlike conventional thermostatic controls, the Chef-O-Matic thinks ahead and tapers off temperature build-up in time to avoid overshooting the allowable maximum.

Thus, the cook can have complete confidence that sauces and other foods will not be spoiled by excess cooking temperature.



OTHER CHEF-O-MATIC FEATURES

- Infinite number of precision settings, on a linear scale, in either direction of knob rotation
- Temperature control range—100°F to 450°F
- Single unit can control any wattage element up to 3500 watts, including split coil types
- User safety assured by low voltage system between sensor and responder switch
- Rugged sensor—withstands up to 800°F
- Automatically reduces wattage when cooking utensil is taken off surface element

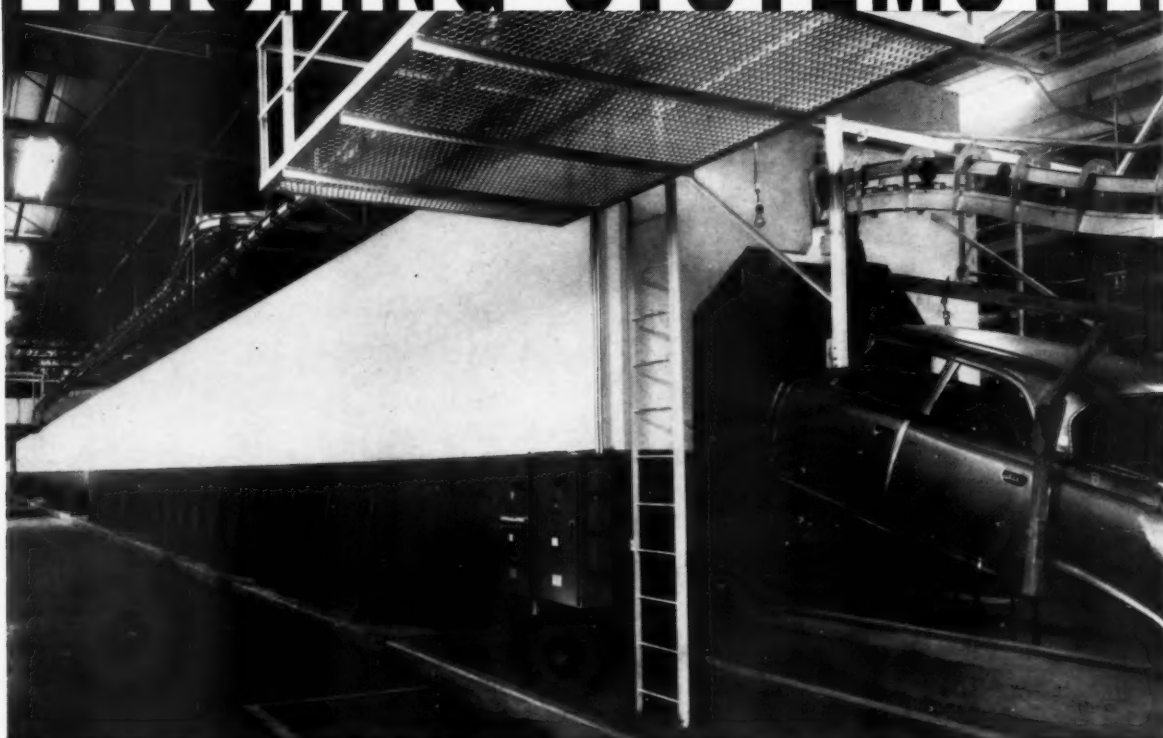


Write for detailed specifications.

KING-SEELEY CORPORATION
ANN ARBOR, MICHIGAN

8317

FINISHING SYSTEMS



Mahon Six-Stage Combined Dip and Spray Cleaning, Rust Proofing and Surface Preparation Machine.

CHRYSLER of CANADA Installs New Antirust Facilities for BODY FINISHING—Including DIP PRIME COATING!



Primer Dip Tank—9000 Gallons of Water-Reducible, Rust-Inhibiting Primer. Bodies are Immersed to a Depth of 18" and are Soaked in this Rust-Proofing Primer for One Minute and Thirty Seconds.

In the new, conveyORIZED anticorrosion equipment recently installed by Mahon in the Windsor Plant of Chrysler Corporation of Canada, Limited, the bodies pass through seven operations of Cleaning, Rust Proofing and Dip Prime Coating.

In the first six operations of cleaning and surface preparation, which include a phosphate coating and chromic acid bath, the bodies are subjected to high intensity impinging sprays while immersed to a depth of 18" in the same chemical solutions maintained at prescribed level in long tanks. In the seventh operation the bodies are dipped to a depth of 18" into a 9000 gallon tank of water-reducible, rust-inhibiting primer—bodies soak in this armour-like rustproof primer for one minute and a half to ensure effective coating of all the metal surfaces which would otherwise be inaccessible in the complex configurations of unitized body construction.

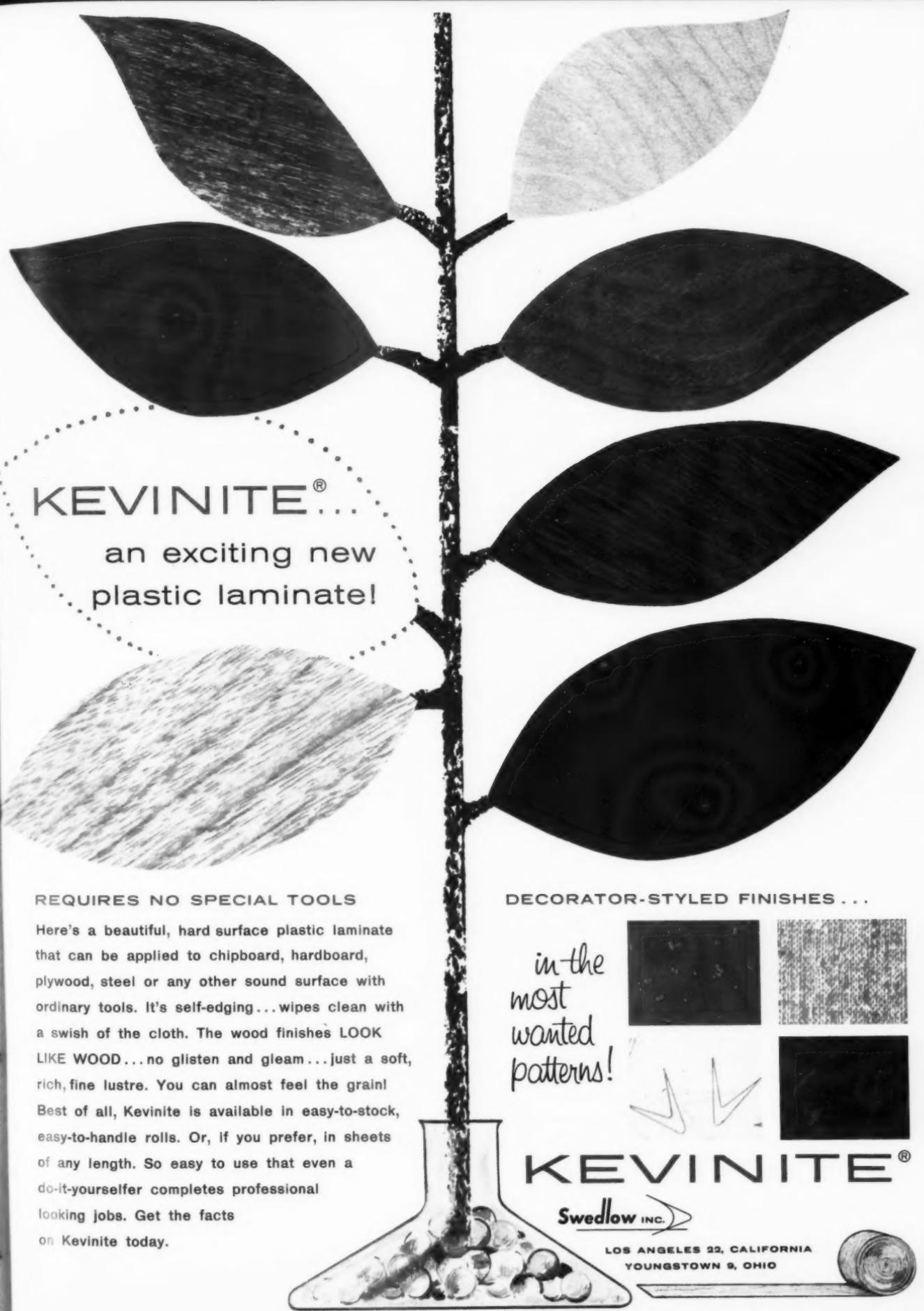
When you consider buying a new finishing system, or any unit of finishing or processing equipment, you, too, will want to discuss methods, equipment requirements and possible production layouts with Mahon engineers . . . you'll find them better qualified to advise you, and better qualified to do the initial planning and engineering which plays such an important role in the ultimate operating efficiency of specially designed equipment of this type.

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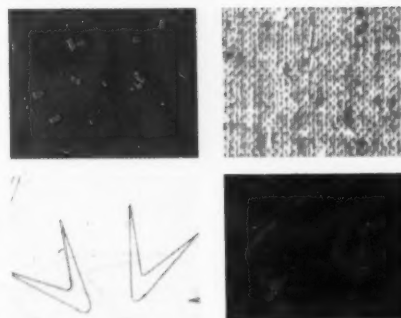
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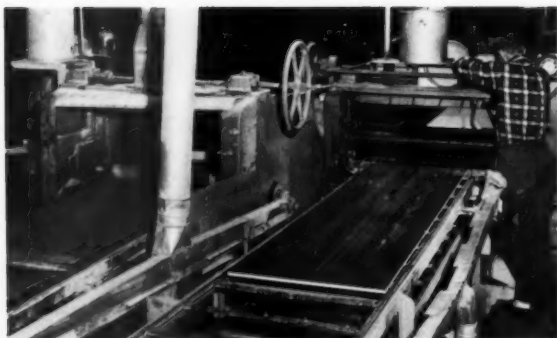


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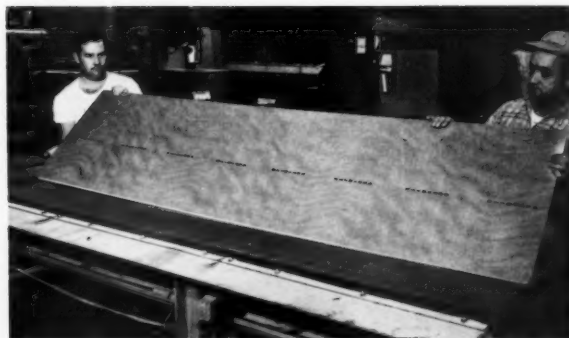
Swedlow INC.

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YOUNGSTOWN 9, OHIO

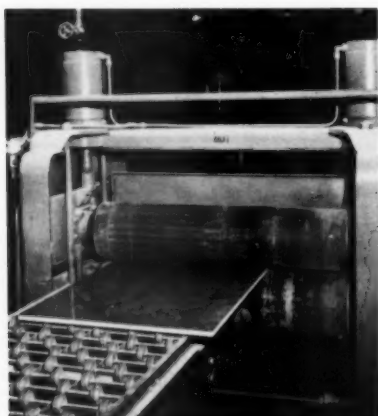




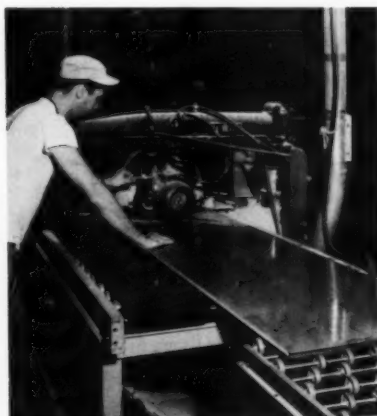
ADHESIVE LINE at left coats bottom of Kevinite. Line at right coats top and bottom of flakeboard core.



HAND POSITIONED KEVINITE positioned on one long sheet of flakeboard. Kevinite is delivered cut-to-size.



POWER ROLLERS completely bond Kevinite to flakeboard. Bond is permanent . . . surface is completely smooth.



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We will work with you on your application problems.

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• Weight (lbs./sq. ft.)224
• Tensile (warp) PSI (lbs./sq. in.)8,500
• Barcol Hardness45
• Water Absorption % (24 hr. immersion)3.8
• Heat Resistance Hot Iron at 375°Possible slight discoloration after 10 min.
• Water Spot Test (24 hr. exposure)No effect
• Surface not affected by normal household products	
• Over-lay Thickness0025

KEVINITE®

Swedlow, INC.

LOS ANGELES 22, CALIFORNIA/YOUNGSTOWN, OHIO

Editor's mail

→ from Page 14

Gentlemen: Could you supply us with a reprint of your article in the November issue of METAL PRODUCTS MANUFACTURING, entitled "Coating coil steel in 48-inch width?"

G. A. Litchfield
American-Marietta Co.
Chicago, Ill.

Gentlemen: We would appreciate your sending us the following material: Two reprints of the article, "Coating coil steel in 48-inch width." Found in METAL PRODUCTS MANUFACTURING for November, 1959, Volume 16, No. 11, Pages 54-58.

Miss Virginia Pearson, Librarian
Merchandise Development Laboratory
Sears, Roebuck and Co.
Chicago, Ill.

Roth to Whirlpool, St. Joseph

Gentlemen: Attached please find the stencil form used to address my copy of METAL PRODUCTS MANUFACTURING magazine. I have recently been transferred from the Whirlpool, Marion, Ohio, Division to the St. Joseph, Mich. plant and would appreciate receiving your magazine at St. Joseph.

Please change my address as indicated.

Walter J. Roth, Director of Labs & Services
Laundry Engineering Division, Whirlpool Corp.

New contacts

Gentlemen: We, here at the National Stove Co., enjoy your magazine very much. We have been able to contact many new suppliers and learn of many new products through reading your publication.

Will you be good enough to send us the address of the Reynolds Ink Co., whose article appeared in your November, 1959 issue on page 20.

Stephen N. Earl
Assistant to Vice President
National Stove Co.
Bayonne, N. J.

The address for the Reynolds Ink Company which you requested is as follows: 4500 Euclid Avenue, Cleveland 3, Ohio.

Reprints for distribution

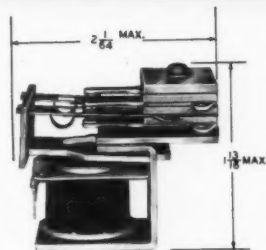
Gentlemen: The article in your September, 1959 issue of METAL PRODUCTS MANUFACTURING dealing with "Ten important points of association operation" was very interesting.

If at all possible, we would appreciate receiving 15 reprints so that they may be distributed to the members of the Metal Ladder Manufacturers Association.

Your cooperation will be greatly appreciated.

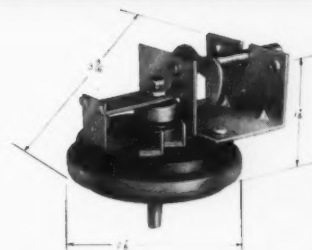
R. L. Werner, Chief Engineer
R. D. Werner Co., Inc.
Greenville, Pa.

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Requirements for a successful heat pump control system

a non-technical article illustrating some of the many control possibilities currently available for heat pump designers

AN MPM DESIGN FEATURE

IN SIMPLEST TERMS, a heat pump is an air conditioner equipped with a reversing valve. This valve reverses the flow of the refrigeration cycle and extracts heat from the outside air or other medium. Through a cycle of evaporation, compression and heat transfer, heat is "pumped" indoors. When the cycle is reversed, the unit serves as a conventional air conditioner.

Refinement of this process is obtained by a careful selection of control devices. The design engineer, by his choice of thermostats, switches, and valves, can "build" a control system for the heat pump that offers the user versatility of operation and maintains the maximum performance level of the system.

Some of the operating functions that can be built into the heat pump by selecting the proper controls include automatic reversal of the heating-cooling cycle, humidity control, auxiliary heating, variation of fan speed, and the removal of ice or frost from coils.

The following discussion and accompanying illustrations describe a simple control system that is expanded by the addition of "building blocks" (control devices) to the point where the unit is given a high degree of heating-cooling flexibility.

A thermostat, compressor, and fan are the basic elements of a cooling unit. When a reversing valve and a double-switch thermostat are added, the system is given the ability to heat as well as cool (Fig. 1). In addition, it is necessary to modify the basic refrigeration system for heating and cooling, design the heat exchangers for both functions, and provide for adequate throttling in both directions of refrigerant flow.

A solenoid-operated pilot valve, which is an integral part of the reversing valve, utilizes the pressure differential of the system to maintain the four-way reversing valve in one of two possible positions. The solenoid coil is generally energized when the unit is in the heating phase.

Manual selection

A manual selector switch can be added to this basic circuit to make available the following choices of operating conditions: "off;" "fan only;" and "fan and system." This switch may be a separate component or a rotary switch furnished as part of the thermostat package. In the latter case, two concentric dials are provided, which allow the user to set the desired room temperature with the inner dial and to select a mode of operation by turning the outer dial. The mode of operation can be changed without disturbing the temperature setting.

A simple single-switch thermostat can be used if a manual heating-cooling change-over control is desired (Fig. 2).

Control of fan speeds is also possible by proper choice of the selector switch. The system illustrated (Fig. 3) allows a choice of three fan speeds when the compressor is not operating, as well as two fan speeds when the system is operating.

Some air conditioners may require continuous fan operation in the cooling phase and automatic (cycling) operation of the fan in the heating phase. In this case, a single-pole, double-throw relay is added to the thermostat and selector switch (Fig. 4).

During the heating phase of the unit's operation, ice may form on the outside heat exchanger and severely reduce the efficiency of the system. To prevent this, a de-icer control should be added to the unit (Fig. 5). This control detects the presence of ice on the heat exchanger and automatically brings about a de-icing cycle by reversing the flow of refrigerant. The outside coil then acts as a condenser and receives the hot discharge gas. When the ice is removed,

the de-icer control causes the unit to return to the heating cycle. The fan operation should be suspended during the de-icing cycle to avoid blowing cool air into the room.

Supplementary heating package

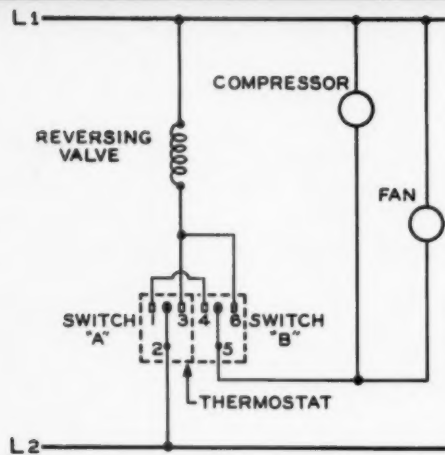
A supplementary heating package in conjunction with the heat pump is necessary in most climates (Fig. 5). The supplementary package consists of resistance heaters which are switched on automatically when needed. Low-temperature return air or low outside temperature may serve as the thermostatic trigger to activate the heaters. If return-air temperature controls the operation of the supplementary heaters, a three-stage thermostat is required, as shown in Fig. 5. This provides one stage of cooling and two stages of heating. If outside temperature controls the auxiliary heater, a two-stage thermostat is used in place of the three-stage thermostat (refer to Fig. 3) and a separate thermostat which senses the outside air is placed in series with the auxiliary heater. The operation of the auxiliary heaters cannot be turned on when the system is in the cooling phase.

A further addition to the heat pump control system to help maintain optimum performance levels is the evaporator defrost control (Fig. 6). Straight cooling units and heat pumps in their cooling phase will suffer a reduction in cooling capacity if the inside coil, acting as an evaporator, accumulates a layer of ice. The sensing element of the evaporator defrost control attached to the coils of the evaporator will sense the resulting drop in temperature and cause defrosting by interrupting the compressor operation and energizing the auxiliary heater during the defrost cycle. For this operation the evaporator defrost control must be single-pole, double-throw, as shown in Fig. 6. If auxiliary heaters are not used, the evaporator defrost control need be only single-pole,

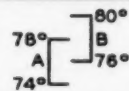
to Page 85 →

This feature is based on data and illustrations supplied by John Lieberman, project manager, and the engineering staff of Ranco, Inc., Columbus, Ohio.

turn this page for 8 Figures (P. 24 & 25) →

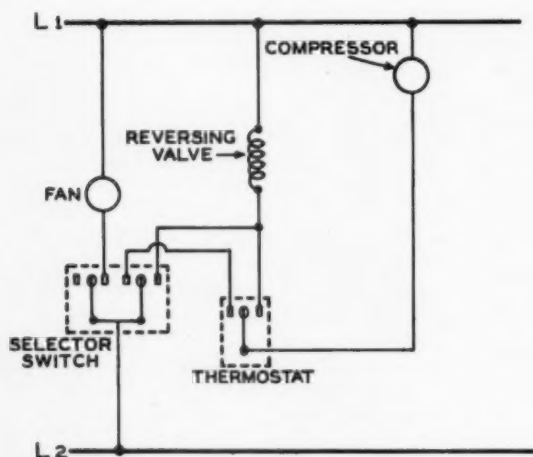


HEAT PUMP
HEATING-COOLING
(REVERSE CYCLE)
AUTOMATIC CHANGEOVER
FAN CYCLES WITH COMPRESSOR
TYPICAL THERMOSTAT OPERATION



TEMP.	SWITCH CIRCUITS	COMP-RESSOR	REV. VALVE	RESULT
74°	2-3 5-6	ON	ON	HEATING
78°	2-1 5-6	OFF	OFF	OFF
80°	2-1 5-4	ON	OFF	COOLING
76°	2-1 5-6	OFF	OFF	OFF
74°	2-3 5-6	ON	ON	HEATING

FIG. 1 — COMPLETE CIRCUIT SHOWING BASIC COMPONENTS OF A HEAT PUMP. A TYPICAL OPERATING CONDITION OF THE DOUBLE-SWITCH THERMOSTAT IS SHOWN IN THE ACCOMPANYING TABLE. THE CHANGEOVER FROM HEATING TO COOLING OCCURS AT 80° F., AND THE SYSTEM REVERTS TO HEATING AT 74°. RETURN AIR TEMPERATURE BETWEEN 74° AND 78° CYCLES THE HEATING PHASE, AND TEMPERATURE SWINGS BETWEEN 76° AND 80° CYCLE THE COOLING PHASE.

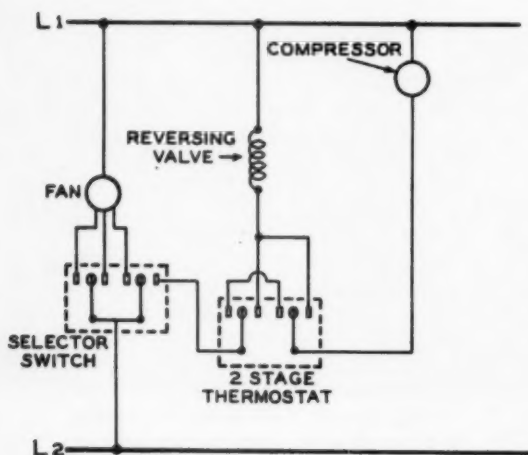


HEAT PUMP
MANUAL CHANGEOVER
FROM HEATING TO
COOLING.

AVAILABLE FUNCTIONS:

1. OFF
2. FAN ONLY
3. FAN & COOLING
4. FAN & HEATING

FIG. 2 — THE ADDITION OF A SELECTOR SWITCH TO THE BASIC CIRCUITRY SHOWN IN FIG. 1 MAKES POSSIBLE THE MANUAL SELECTION OF AN "OFF" POSITION, "FAN ONLY" OPERATION, AND THE PREVIOUS "FAN AND SYSTEM." IN THIS ILLUSTRATION, THE SELECTOR SWITCH IS ALSO USED FOR MANUAL CHANGEOVER FROM HEATING TO COOLING (NOTE SINGLE SWITCH THERMOSTAT). THIS CIRCUIT ARRANGEMENT ALLOWS THE USER FOUR OPERATING CONDITIONS.

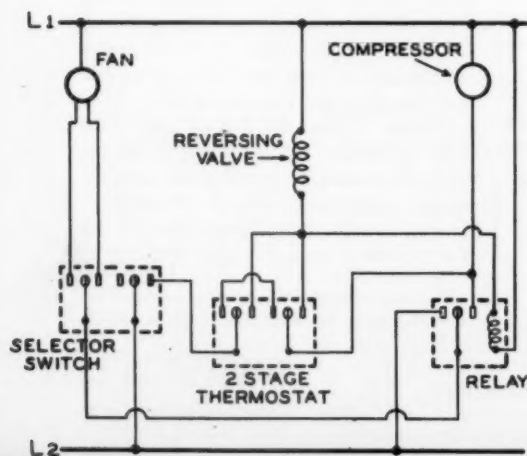


HEAT PUMP
AUTOMATIC CHANGEOVER
3 FAN SPEEDS

AVAILABLE FUNCTIONS:

1. OFF
2. HIGH FAN ONLY
3. MEDIUM FAN ONLY
4. LOW FAN ONLY
5. SYSTEM & HIGH FAN
6. SYSTEM & MEDIUM FAN

FIG. 3 — A FURTHER STEP IN THE SOPHISTICATION OF A HEAT PUMP CONTROL SYSTEM IS THE PROVISION FOR SELECTION OF VARIOUS FAN SPEEDS. THE SELECTOR SWITCH ALLOWS A CHOICE OF ALL THREE FAN SPEEDS WHILE THE COMPRESSOR IS NOT OPERATING, AS WELL AS TWO FAN SPEEDS WITH THE SYSTEM OPERATING. AUTOMATIC CHANGEOVER IS PROVIDED BY THE DOUBLE-SWITCH THERMOSTAT.



HEAT PUMP
AUTOMATIC CHANGEOVER
2 FAN SPEEDS
SELECTIVE FAN OPERATION
(CONTINUOUS—WHEN IN COOLING)
(AUTOMATIC—WHEN IN HEATING)

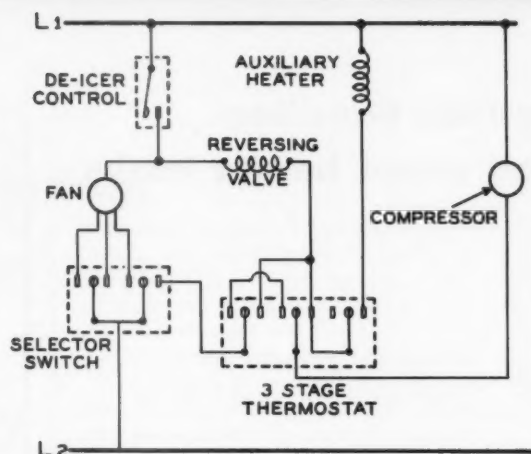
AVAILABLE FUNCTIONS:

1. OFF
2. HIGH FAN ONLY
3. LOW FAN ONLY
4. SYSTEM & LOW FAN
5. SYSTEM & HIGH FAN

FIG. 4 — IF CONTINUOUS FAN OPERATION IN THE COOLING PHASE AND AUTOMATIC (CYCLING) OPERATION OF THE FAN IN THE HEATING PHASE ARE REQUIRED, A SINGLE-POLE DOUBLE-THROW RELAY MAY BE ADDED TO THE THERMOSTAT AND SELECTOR SWITCH. IN THIS CASE, TWO FAN SPEEDS ARE AVAILABLE. THE SELECTOR SWITCH ALLOWS SEVERAL CHOICES OF OPERATING CONDITIONS, AS WELL AS CHOICE OF FAN SPEEDS IN "FAN ONLY" AND "FAN AND SYSTEM" OPERATION.

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FIG. 5 — AUTOMATIC DE-ICING AND AUXILIARY HEATING HAVE BEEN ADDED TO THIS HEAT PUMP CIRCUIT. THE AUTOMATIC DE-ICER CONTROL DETECTS THE PRESENCE OF AN ICE BLANKET THAT MAY FORM ON THE OUTSIDE HEAT EXCHANGER DURING THE HEATING PHASE, AND AUTOMATICALLY INITIATES A DE-ICING CYCLE BY REVERSING THE FLOW OF REFRIGERANT. AUXILIARY RESISTANCE HEATERS ARE USED TO SUPPLEMENT THE HEAT PUMP IN MANY CLIMATES.



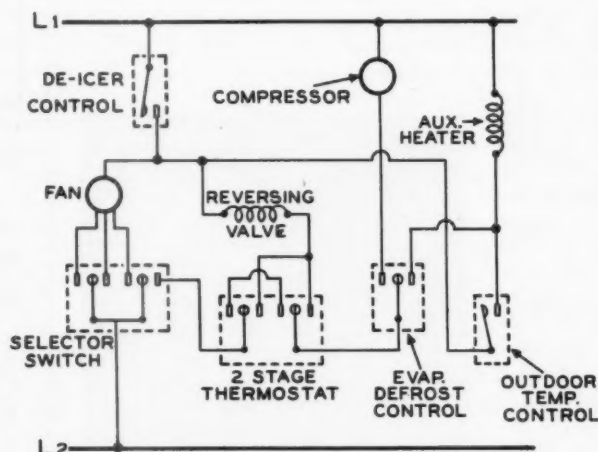
HEAT PUMP
AUTOMATIC CHANGEOVER
AUXILIARY HEAT (1STAGE
COOLING, 2 STAGES HEATING)
3 FAN SPEEDS
DE-ICER CONTROL

AVAILABLE FUNCTIONS:

1. OFF
2. HIGH FAN ONLY
3. MEDIUM FAN ONLY
4. LOW FAN ONLY
5. SYSTEM & HIGH FAN
6. SYSTEM & MEDIUM FAN

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FIG. 6 — EVAPORATOR DEFROST CONTROL IS INCORPORATED IN THIS CIRCUIT. WHEN FROST FORMS ON THE COILS, THE DEFROST CONTROL STOPS THE COMPRESSOR AND BRINGS ON THE AUXILIARY HEATER, WHICH AIDS IN THE DEFROSTING. THE EVAPORATOR DEFROST CONTROL IS A SINGLE-POLE DOUBLE-THROW SWITCHING DEVICE CONNECTED IN THE CIRCUIT LEADING TO THE COMPRESSOR MOTOR AND AUXILIARY HEATER. THIS UNIT ALSO HAS AUTOMATIC CHANGEOVER, THREE-SPEED FAN AUXILIARY HEAT, AND DE-ICER CONTROL.



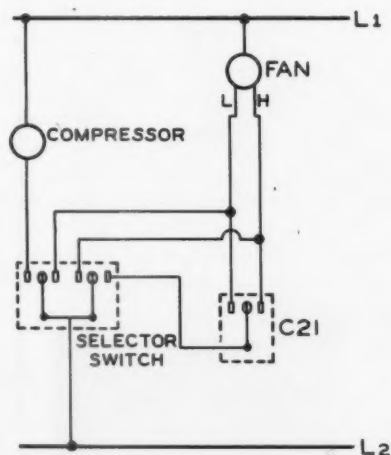
HEAT PUMP
AUTOMATIC CHANGEOVER
AUXILIARY HEAT (FUNCTION
OF OUTDOOR TEMPERATURE
ALSO FOR ACCELERATION OF
EVAPORATOR DEFROST)
3 FAN SPEEDS
DE-ICER CONTROL
EVAPORATOR DEFROST
CONTROL

AVAILABLE FUNCTIONS:

1. OFF
2. HIGH FAN ONLY
3. MEDIUM FAN ONLY
4. LOW FAN ONLY
5. SYSTEM & HIGH FAN
6. SYSTEM & MEDIUM FAN

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FIG. 7 — THERMOSTATICALLY CONTROLLED FAN SPEED IN THE AIR CONDITIONER COUNTERACTS HIGH HUMIDITY BY LOWERING THE COOLING CAPACITY AND INCREASING THE DE-HUMIDIFYING CAPACITY OF THE UNIT THROUGH A REDUCTION IN FAN SPEED WITH CONTINUING COMPRESSOR OPERATION. THE UNIT IS A STRAIGHT COOLING DEVICE WITH A TWO-SPEED FAN, PLUS MANUAL AND THERMOSTATIC FAN SPEED CONTROL.



COOLING UNIT

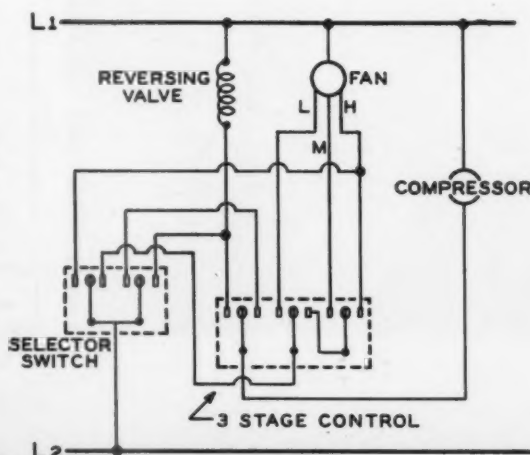
2 SPEED FAN WITH MANUAL AND THERMOSTATIC SPEED CONTROL

AVAILABLE FUNCTIONS:

1. OFF
2. LOW FAN ONLY
3. HIGH FAN ONLY
4. AUTO. FAN ONLY
5. COOLING & HIGH FAN
6. COOLING & AUTO FAN

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FIG. 8 — THERMOSTATIC FAN CONTROL CAN ALSO BE UTILIZED IN THE HEAT PUMP. WITH A THREE-STAGE CONTROL AND A SELECTOR SWITCH INCORPORATED IN THE CIRCUIT, IT IS POSSIBLE TO REDUCE FAN SPEED AS THE TEMPERATURE DECREASES IN COOLING, AND TO MAINTAIN HIGH FAN SPEED IN THE HEATING PHASE. IN THIS EXAMPLE, THE SELECTOR SWITCH IS USED TO GIVE A CHOICE OF "OFF" POSITION, "FAN ONLY" OPERATION, AND A MANUAL SELECTION OF COOLING AND HEATING.



HEAT PUMP
(MANUAL CHANGEOVER)
3 FAN SPEEDS
(THERMOSTATIC SPEED
CONTROL)

AVAILABLE FUNCTIONS:

1. OFF
2. HIGH FAN ONLY
3. AUTO. FAN ONLY
4. COOLING & HIGH FAN
5. COOLING & AUTO. FAN
6. HEATING & HIGH FAN

Stud welding simplifies handling of glass-lined water heater tanks

MORE THAN 50,000 GLASS-LINED water heater tanks have passed through porcelain enameling furnaces without handling loss since the Republic Appliance Corp., Erie, Pa., began using special rectangular end-welded studs as hangers instead of hand-welded stampings.

The studs were specially designed for extra strength while the tanks are being conveyed through the enameling furnace, where they are fired. Strength of the weld and the studs is such that the studs may be bent flat to provide proper fitting of the outer casing.

The studs, which are applied with a lightweight stud welding gun, measure $\frac{3}{8}$ -inch thick, $\frac{7}{8}$ -inch wide, and $1\frac{1}{4}$ -inches long. They have a special reduced base only $\frac{5}{8}$ -inch wide and a $\frac{3}{8}$ -inch diameter hole to accommodate conveyor hooks. The welding end is loaded with a special aluminum pellet which acts as a deoxidizing agent in the "Nelweld" process. Special equipment (i.e. gun, control box, etc.) is used in the end welding of the specially-designed studs.

The rectangular stud replaced a rectangular strap made from 12 gauge material about $1\frac{1}{2}$ -inch wide and $4\frac{1}{2}$ to $5\frac{1}{2}$ inches in length.

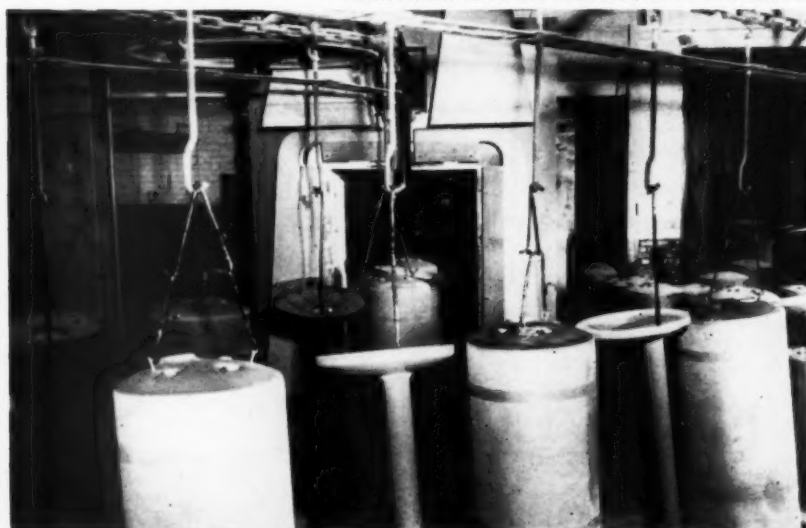
Approximately a $\frac{5}{8}$ -inch diameter hole was stamped into the strap which was then manually arc-welded to top of tank and bent to form an "L"-shaped figure.

After fabrication, tanks are assembled in groups of six or eight at a station where they are inspected. The tanks are then up-ended onto a steel ground strip 20 feet long and two feet wide. The inspector goes down the line and welds two studs to the head of each tank. By laying studs and ferrules on each tank beforehand, studs are welded at the rate of six to eight per minute.

For additional information, contact Special Projects Editor, METAL PRODUCTS MANUFACTURING, York St. at Park Ave., Elmhurst, Ill.



(Above) — Using light weight stud welding gun for application of "hanger" studs to heads of glass-lined water heater tanks. (Below) — These heaters are carried through the enameling furnace on "hangers" designed to provide maximum strength during seven minutes' firing at 1600° F.



PHOTOS COURTESY NELSON STUD WELDING DIV., GREGORY INDUSTRIES, INC.

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The coated steels

by Lester F. Spencer • CONSULTANT

ZINC COATED STEEL PART TWO: CONCLUSION



Zinc coated steel, which is frequently termed "galvanized iron," has as one of its more important characteristics an excellent resistance to atmospheric corrosion. This material will offer electrolytic protection; that is, where there is an exposed edge, such as that resulting from a shearing operation, the corrosion will be on the zinc coating rather than on the exposed base metal.

Standard "hot dipped" galvanized material is satisfactory on products which require little mechanical working; however, flaking of the protective coating will result when the sheet is submitted even to a moderate press forming operation. This objectionable flaking was traced to the formation of a brittle iron-zinc alloy layer that formed at the interface of the base metal and the zinc coating. After extensive experimentation, it was found that an aluminum addition to a molten zinc bath completely removed this brittle zone. This modification led to the development of a material in which the zinc adheres so tightly to the base metal that severe forming can now be realized without objectionable flaking of the coating.

Working characteristics

Zinc coated sheet and strip usually arrives from the mill with a protective oil coating. Where a limited number of sheet material is involved, this oil coating can be removed readily with either naphtha or kerosene. On a production basis, the commercial type of degreasing machine, or a spray washer having an emulsion-type cleaner, can be effectively used to remove this soil. In the latter case, subsequent operations would include a hot water rinse which would remove all traces of cleaner, and a drying operation. Due to the re-activity of the zinc coating to acids and alkalies, alkaline cleaners and acid dips should be avoided.

Zinc coated steel can be adequately

formed in a variety of shapes by such procedures as press, brake, and roll forming; deep drawing and spinning. In a press forming operation, the advantages in the use of coiled stock is self evident when applied to multi-station equipment. In the event of a deep drawing operation, individual blanks are processed very similarly to that used for the uncoated steel in that equivalent press power, die material, and die design is employed. In some instances, the average die clearance used for forming the uncoated material is satisfactory; however, for best results, a clearance that is slightly on the heavy side will compensate for the extra increase of thickness realized by the coating. Press equipment should be of the slow, double-action type. Any standard lubricant used

for the uncoated stock will also serve well in the forming of the zinc coated steels. Generally, it is not necessary to remove these drawing lubricants after the part has been formed unless they are of a corrosive nature.

Roll forming is used extensively in shaping zinc coated steels into channels, moldings, and other complex shapes that are of a repetitive nature and of a high production quantity. The practices that are employed are similar to that used for the uncoated stock, and care must be taken to protect the coating by the use of highly polished rolls and an adequate lubricant such as kerosene or light straw oil. In either power or hand brake forming operations, there are occasions where a lubricant is not required provided polished dies are used. Here again, the operations are similar to that used for the uncoated materials.

Welding

A problem with all coated materials is that of welding. However, contrary to popular belief, experiences with the various welding processes normally employed in the joining of the zinc coated steel reveals that there is little loss of its inherent corrosion resistance. With respect to fusion welding procedures, which are used to a considerable extent, the loss of corrosion resistance will be in proportion to the number of beads

Basket cylinder of a combination washer-dryer being spot welded by a welder employing sixteen guns. In this view, basket is ready for insertion of end rings, and baffles have been spot welded at four openings. End rings are then pressed into place and welded at flanges.

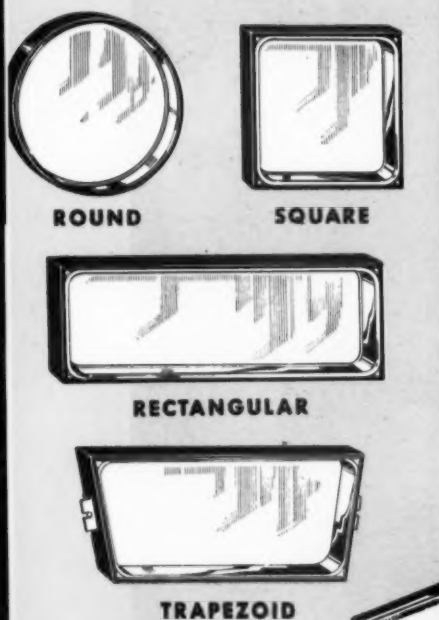


A. BELANGER... another user of PERMA-VIEW® WINDOWS



A great majority of the leading manufacturers of ranges (both free-standing and built-in) now use PERMA-VIEW windows to enhance the appearance and convenience and economy of their products. During the past few years the demand for "visible baking" has continued to grow. This "No-Fog" window is the best and most economical answer to this demand.

The PERMA-VIEW window is pre-engineered and comes to you ready for immediate installation in your range, "out of our carton into your door." It is mechanically sealed to prevent infiltration of vapors and to eliminate "fogging." Let our specialized production lines serve as a part of your sub-assembly facilities. If you do not use a window, if you make your own window, or if you buy your window from another source, we suggest you phone or write us for complete details on the ease and economy of adding this proven sales feature to your new ranges.



We can manufacture any shape, any size, any thickness to meet your engineering requirements. Alternate methods of attachment may be used.

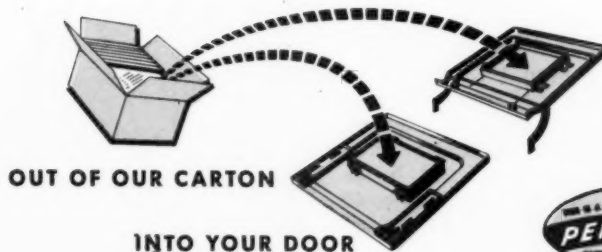
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PERMA-VIEW oven-door windows



MILLS PRODUCTS INCORPORATED

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that are required to form a joint. Resistance welding should be used whenever possible since less coating is affected by this method.

Fusion welding procedures require jigs to prevent warping, to conduct heat away from the parent metal, and as an aid in assuring a dense and uniform weld. The jaws should be as close to the weld edges as possible and tight enough to prevent excessive contraction and expansion. Since the fumes emitted during a fusion welding operation are poisonous, it is essential that the operator be protected with a mask and that the welding be performed where proper air circulation is present.

The procedure employed in metallic arc welding zinc coated material with mild steel shielded-arc electrodes is similar to that used for the uncoated stock of similar thicknesses. However, to prevent the absorption of the volatilized zinc by the deposited metal, the electrode should be held sufficiently high above the joint so that the zinc oxide fumes can escape. In addition, the electrode should also be directed slightly ahead of the welding pool.

In the carbon arc welding of this material, a 5/32-inch diameter welding rod in combination with a 5/32-inch diameter carbon electrode is recommended for the welding of 16 to 18 gage material. Where the gage is increased to 20 or 22, a 1/16-inch diameter filler rod along with a 5/32-inch diameter carbon electrode is used. A filler rod made from a bronze type of alloy having a low melting point is normally employed. Good results have been obtained with an alloy containing copper, manganese and silicon (of the Everdur type) carrying a tin composition coating. The tin coating not only assists in absorbing the shock of the arc, but also will tend to flow to either side of the deposited weld metal and cover any part of the zinc coating that is destroyed by welding.

The carbon electrode should have a long, thin taper which is held in the electrode holder at about 1½ inches from the point. Direct current, straight polarity is employed, the current ranging from 50 amperes for 16 gage material to about 20 amperes for the lighter gages, depending upon the type of joint being made. The arc should not be directed against the sheet metal but on the filler rod, this rod being held at an approximate 20 degree angle. If the proper current is used and the arc is as short as can be maintained, smooth welds will result.

In the oxy-acetylene process, the use

of a bronze filler rod is suitable for the joining of sheets that are 12 gage or lighter, provided the rod is suitably coated. A recommended welding rod applicable for braze butt welding is Ox-weld No. 1 HT; this being a fumeless deoxidizing bronze type. A neutral flame is applied directly to the filler rod and, for best results, the filler rod should be moved back and forth to produce a "ripple" type weld deposit.

As compared to mild steel resistance welding procedures, the spot and seam welding of zinc coated material requires about 25 per cent higher welding current, shorter weld periods, which may vary from 2 to 8 cycles for 60 cycle ac, and slightly higher electrode pressures to prevent the zinc from vaporizing, forming an arc, and burning through the sheet. Class II hard copper alloy tips are recommended. As in the welding of aluminized-steel, an effective water cooling system is essential in preventing the molten coating from alloying with the electrode material. In addition, frequent cleaning of the electrodes is essential in order to realize good electrical contact so necessary to obtain a strong, clean weld. The use of knurl drive on the seam welders employed in joining this

type of material will aid in breaking the alloy coating and pickup on the wheel faces and reducing the cleaning periods to some extent.

Re-coating welded joints

When it is essential to have full protection of the zinc coating, the usual procedure involves cleaning of the welded joint followed by a re-coat. The first phase can be performed either by wire brushing or by light grinding to remove any contamination in the form of oxide or scale. After the joint has been thoroughly cleaned, it can then be re-coated by soldering, metal spraying, brush or spray aluminum paint.

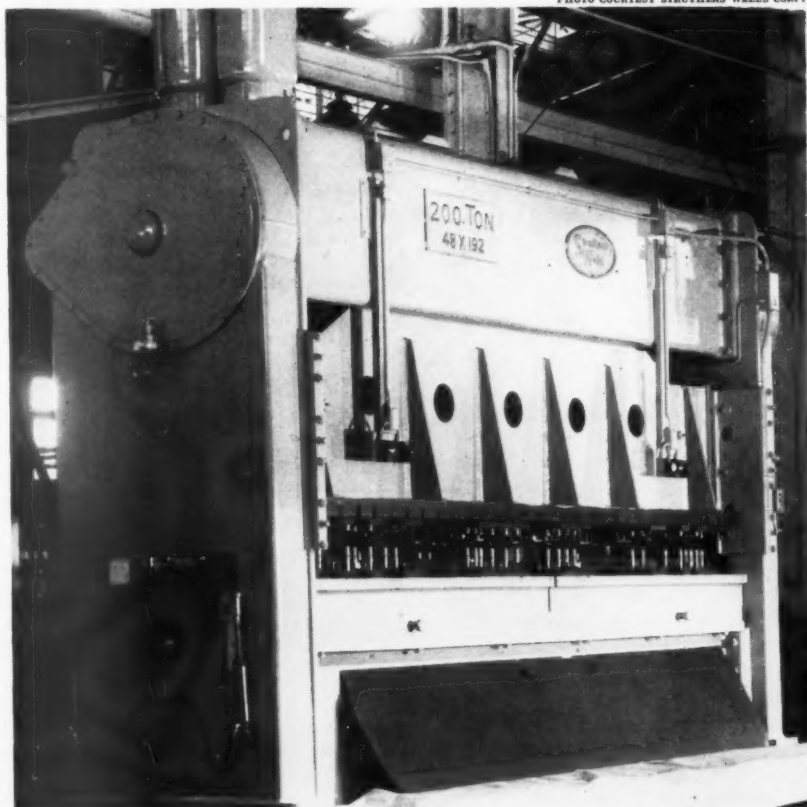
Protection of the zinc coating

Under adverse corrosion conditions, or for the purpose of obtaining a decorative effect, component parts made from zinc coated steel may be painted. In order to prevent any unnecessary difficulty, a phosphate coating is recommended as a primer to obtain the required adhesion. Since sheet and strip with a phosphate coating may be obtained from the mill, the formability and weldability of this material is of specific concern.

to next Page →

In this photo, punching and notching is done on a 200-ton machine. Punch and die sets for a typical job may be clearly seen. The unit has openings in the end through which steel sheets are fed into the dies.

PHOTO COURTESY STRUTHERS WELLS CORP.



The bonderized mill finish material can be drawn severely without injury to the zinc coating. The precautions stated before as to press type, die clearances, and lubricant holds equally as well in the forming of this material. No pigmented lubricants or heavy soaps should be used.

Since the bonderized surface is a poor conductor and actually acts as an insulator, a higher voltage and current is required when compared to the welding of the standard coated material. It is recommended that the smallest possible diameter spot be used. Excellent welds have been made with a 3/16 inch spot. In addition, the highest possible electrode pressure, without causing indentation in the sheet, should be used. In the welding of 24 gage bonderized coated steel, excellent results have been obtained with 250 to 300 pounds pressure on the electrode, and by using a 3/4 inch flat electrode on the bottom and a dome-shaped electrode on the top. The use of a flat electrode on the exposed side of the fabricated part will aid in reducing finishing costs.

In the event that the untreated zinc coated material is used where "sweating" may occur, or where there is a possibility that it may be exposed to stagnant water, the zinc coating may be protected by the use of a chromate surface treatment.

Of tremendous importance to a fabricating shop is the method employed in the storage of this material. The storage of either the bonderized or the untreated zinc coated material should be in an area that is dry and of a uniform temperature. Chemicals, especially salts, alkalies, and acids, should not be used or stored in the same general area. In the event the coating is damaged during the storage period, notify your supplier who will suggest methods of restoring the surface of the material in question.

Tin and terne plate

The characteristic qualities of tin plate would consist of strength imparted by the base metal, lightness, pleasing appearance, and relative ease of fabrication. Tinned sheets can be severely deformed without serious damage to the coating. Rather complicated shapes can be obtained by those standard operations as exemplified by stamping, drawing, rolling, bending, curling, and lock seaming.

It is an established fact that all tinned sheet, regardless of the method used to obtain this coating, has a certain degree of porosity. The degree is governed by both the method used in obtaining the

coating and the thickness of the coating. It has also been demonstrated that the degree of corrosion resistance of this coated product is directly related to the degree and distribution of this porosity; the greater the porosity, the more severe will be the corrosive attack.

On the basis that severe bending will cause localized areas of high porosity values, and subsequent higher corrosive attack in these areas, high quality items are frequently re-tinned after fabrication either by a hot dip procedure or by electro-deposition. In other instances, fabrication is performed on a suitable base composition after which the tin coating is applied. Individual cases must be evaluated in terms of both end use and economics.

Terne plate, which has been used in the past as a material choice for roofing sheets, clad doors, and shutters, is now being used to a larger extent for manufactured articles; the coating will not flake off, and is quite ductile for press forming operations such as stamping and deep drawing. The procedures used are quite similar to that employed in low carbon steel, although adequate clearance and sufficient lubrication is required.

The composition of terne plate may vary considerably; commercial terne coatings may have a tin content as low as 12 per cent, and other coatings may contain up to 50 per cent tin. The term "short terne" refers to sheets of a size normally standard for use as roofing material. "Long ternes" are sheets that are comparatively larger and very similar to galvanized sheet stock as to size. Terne plate has a somewhat mottled appearance; the size of the spangle or mottle giving some indication as to the thickness of the coating. The size of the

mottle will decrease with an increase of coating thickness provided the manufacturing practices are similar.

The problems related to the welding of both tin and terne plate are those that are common to the welding of many of the low melting point coatings. In an arc welding procedure, melting will occur but does not volatilize at the arc welding temperature except for that portion covered by the bead. There is also an increased tendency toward porosity; however, this can be minimized by using an electrode with the least tendency toward porosity, such as "E6010 or E-6011" type electrode and weld as in joining galvanized material. Re-coating of the weld surface is usually required.

These coated materials can also be spot welded and, although the coating will fuse into the base metal on the inside surfaces, the coating on the outside surface may not be seriously damaged. In comparison to the spot welding of mild steel, larger current values are used, and both the time and current values are controlled so that the coating on the outside of the electrodes are unaffected. In addition, full electrode pressure is maintained until the stock is cooled below the melting point of the coating, and means a longer "hold time" than that experienced with the uncoated steel. Flat tipped or dome-faced electrodes are recommended to prevent or minimize indentation. Although the electrode markings may be visible, the surface of the weld will be clean and bright. Typical resistance welding procedures for terne plate are given in Tables 1 and 2.

Acknowledgement is made to W. E. McFee and the Armco Steel Corp. for their aid to the author in the preparation of this manuscript.

Table 1 Spot Welding Conditions for Coated Steel (from Resistance Welding Manual, RWMA Publication)

Type Coating	Galvanized		Aluminized		Terne Plate	
Sheet Thickness, Inches	0.0230	0.0625	0.0375	0.0125	0.037	0.031
Welding Current, Amperes	8500	8010	15,000	—	—	—
Weld Time, Cycle	20	70	10	5	5	6
Electrode Force, Pounds	400	400	700	500	625	400
Tip Diameter, Inches	3/16	1/4	2" radius	1/8	1/4	3/16

Table 2 Seam Welding Terne Plate, (from Resistance Welding Manual, RWMA Publication)

Sheet Thickness, Inches	Pressure, Pounds	Cycles On	Cycles Off	Speed, F.P.M.	Secondary Amperes
0.062 - 0.062	850	4	2	5.2	20,000
0.0375 - 0.0375	560	3	3	7.6	19,000
0.0375 - 0.052	680	3	3	6.3	19,000
0.025 - 0.025	650	1	3	5.5	20,000
0.037 - 0.037	500	3	3	3.5	17,000
0.062 - 0.062	900	4	6	6.0	33,000
0.037 - 0.037	750	3	3	6.0	21,000
0.050 - 0.050	950	3	1	5.0	20,000

Modernized finishing and assembly facilities at Armstrong



Number 1 assembly line is used for small circulating and radiant gas heaters. Portable ironers are also assembled on this line.

FINISHING AND ASSEMBLING 160 cabinet ironers per day proved to be quite a feat for Armstrong Products Corp., Huntington, W. Va., because of multi-product requirements in the plant.

The company was engaged in the manufacture of gas heaters and electric ironers when they received two sizable government contracts—one for post office stools and the other from the Navy

for electric heaters for shipboard use. The stools were to receive an organic finish, while the electric heaters were to be furnished in natural finish aluminum.

The problem of modernizing and expanding finishing and assembly facilities then came up. The services of a

Cincinnati firm of management consultants were enlisted and many changes were made throughout the plant, especially in handling equipment and improved line production. Factory warehouse space was converted into manufacturing facilities to the extent that

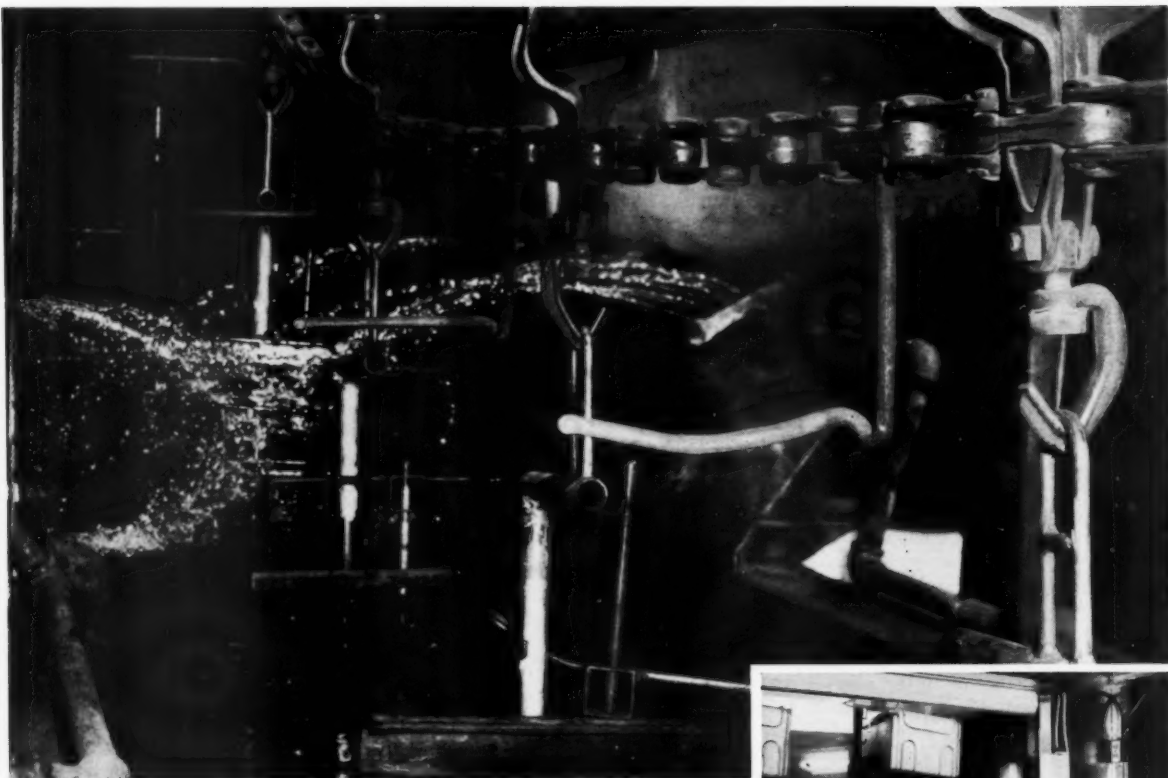
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The electrostatic spraying disc can be seen in the background. After parts leave this unit, they move directly to the infra-red drying tunnel.



This is number 3 assembly line with Model 5900 cabinet ironers being assembled, and it can accommodate vented circulating heaters and post-office stools, as well.





KERNS' SOLVENT TYPE STRIPPERS VITAL PART OF HOTPOINT PRODUCTION PROCESS

Continuous production processes at Hotpoint require the stripping of paint from carriers and hooks without slowing down the conveyor lines. A stripper tank is used as an integral part of the production procedures. Carriers or "hooks" are drawn through the solvent type stripper without removal from the conveyor, and then pass through a water spray for rinsing. Tank size is approximately 5,000 gallons, using 3,600 gallons of Kerns' Solvent Type Stripper and 500 gallons of water which floats on the top forming a protective blanket. 200 "hooks" an hour pass through each stripping tank every day. Yet, the Kerns' Solvent Type Stripper is changed only twice a year.

Hotpoint uses Kerns' Stripper because it has extremely long tank life with outstanding stripping power.

MEMO BILLING TRIAL BASIS

Find out, today, what Kerns' Strippers can do for your operation. Try it . . . we supply material for production test . . . no formal invoice rendered unless completely approved in production. Remember . . . with Kerns you get compounds tailored to your production procedures.

Kerns' Solvent Type Stripper assures that "hooks" are absolutely clean before entering leak testing tank which must be kept completely free of any foreign matter at all times.

*Write for further information
regarding Kerns' Memo Billing
Trial Basis, Technical
Data Brochure with
Stripper Selection Chart.*

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Offices in principal cities throughout the U. S. A.

Buyers see 100,000 products at 39th Housewares Exhibit

AN MPM STAFF REPORT

HOUSEWARES MANUFACTURERS jammed Chicago's Navy Pier with more than 100,000 products at the 39th National Housewares Exhibit, January 11-15.

On hand to give cheer to the 734 exhibitors were more than 12,000 buyers, many of whom were reported by exhibitors to be in a buying mood. Combined with the settlement of the steel strike, the receptive mood of the buyers helped reinforce predictions of a prosperous 1960.

Products for every room in the house including the basement and the yard were displayed. Some of the new items introduced included an electric vegetable and fruit slicer, an aluminum ladder with aqua-colored steps and platform, three-dimensional decorations formed by fusing porcelain to stainless steel, a vacuum cleaner with optional

A new infra-red panel heater was introduced at the exhibit by Engelhard Industries. Portability of the unit is demonstrated by model Olga Darina.

EXCLUSIVE MPM PHOTO



Buyers converge on registration desk in Chicago's Navy Pier.

turbine brush, and a large array of other household utensils and specialty products.

New Sunbeam ad policy

Sunbeam Corp. chose the beginning of the exhibit to announce its new co-op advertising policy. The company notified its dealers that only dealer advertising that stresses quality features of Sunbeam appliances and omits prices would qualify for reimbursement.

By emphasizing quality in the ads, Sunbeam hopes to prevent dealers from using the company appliances in bait advertising. The move to stress quality

met general approval from other manufacturers.

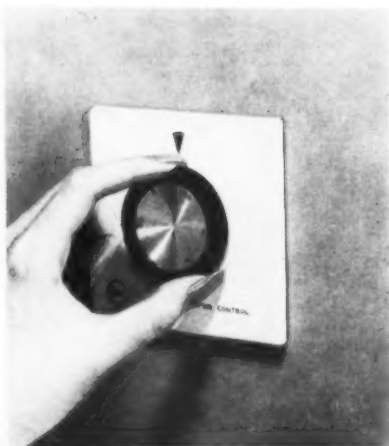
Although talk of price increases was prevalent at the exhibit, two manufacturers announced price cuts. General Electric reduced the suggested retail on its cord reel cleaner from \$79.95 to \$69.95, and the company's steam and dry irons were reduced from \$17.95 to \$14.95. While no specific commitments were made, Dormeyer predicts price cuts as big as seven to ten per cent in their line of new toasters, irons and portable mixers. According to Vice President Maurice Lipsich, the products

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Booth occupied by the Chattanooga Royal Co., Chattanooga, Tenn., displayed the company's full line of portable outdoor barbecue grills.

EXCLUSIVE MPM PHOTO





Remote control for the water heater provides for immediate management of hot water supply.

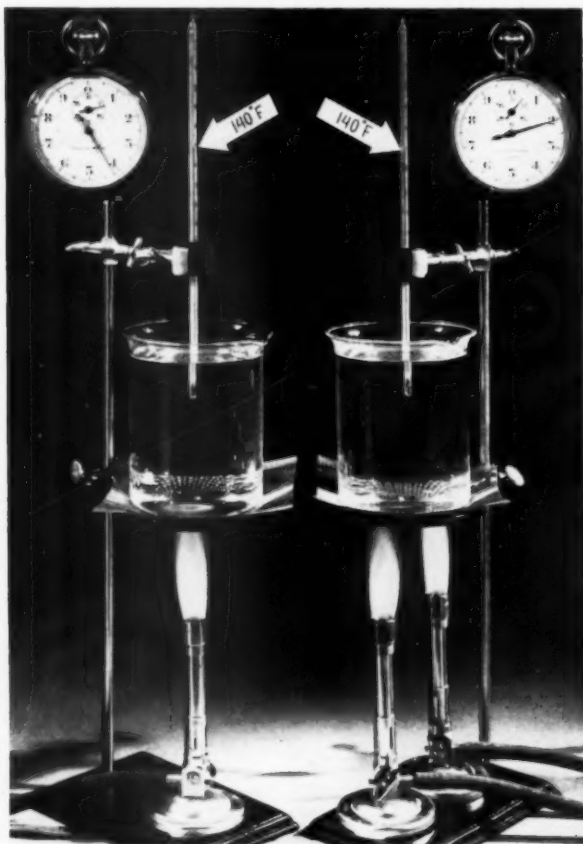
Rheem introduces new concept in water heater design

BY CHANGING A DIAL SETTING, Rheem's new "30-Plus" water heater can be boosted from 30-gallon performance to 50-gallon performance.

The key to this new concept is vari-

able recovery speed made possible by adjustable Btu input. This adjustment causes the gas-fired 30-Plus to produce *more* hot water, instead of merely *hotter* water. With the 30-Plus, the concept of

Performance is dramatized by two one-quart beakers of water, each having been brought up to 140° F. from a starting temperature of 60° F. With two Bunsen burners, the desired temperature is reached in one-half the time required with a single burner. Adjusting the control of the 30-Plus doubles the recovery rate to 140° F., with a rise of 100° F., through a proportionate increase in Btu input.



Manipulating the control dial, the water heater is changed from 30-gallon recovery to any point up to 50 gallons.



hot water supply has been revised from the idea of the number of gallons of storage capacity to the concept of the number of *usable gallons* of hot water per hour.

Need for developing this revolutionary heater was seen by the Home Products Division of Rheem Manufacturing Co. In its over 25 years of water heater production, the company found that sizing a water heater properly for a family is difficult. The conventional water heater was often incapable of keeping up with peak daily usage, to say nothing of increased requirements caused by additions to the family. The expandable feature of the 30-Plus provides for these increased requirements, and when a reduced capacity is necessary, the setting is returned to a lower-capacity point for economical operation.

The high rate of recovery of the 30-Plus can be adjusted to give hot water production in the amounts expected in a 30, 40, or 50-gallon water heater of the usual design. Any setting between these amounts is also possible.

The variation in Btu input has been attained by the development of a burner assembly that can operate on more than one specific volume of gas, along with new controls that give dependable performance in directing the right amount of gas to the burner. It was also necessary to redesign the combustion chamber, flues, and baffling.

Cost of operation of the 30-Plus does not vary greatly from the operating cost of any other gas-fired water heater, according to Rheem engineers. For example, heating any given quantity of water through a given temperature rise requires approximately the same number of Btu's. Thus, in theory, the cost of hot water should not vary. In long-term savings, however, there could be specific economy. The 30-Plus is made for high performance, up to the point of having its lowest Btu input approximately doubled. For this reason, the 30-Plus, with its present temperature of 140°F., is expected to give longer life than a water heater of conventional design that is forced.

The inner tank of the 30-Plus takes advantage of Rheem experience in having made millions of water heaters. Both Rheemglas and Coppermatic models are available in the 30-Plus, according to the homeowner's choice and as indicated by the chemistry of the local water supply.

A wall-mounted thermostat, comparable to control methods of contemporary home heating systems, is optional. Fuel for the heater is natural gas, manufactured gas, or a combination of both.

RANSBURG

What Would Paint Savings Like This* Mean in YOUR Finishing Department?

Quality is all important in the production of fine Metalcraft furniture by George Koch Sons, Inc., Evansville, Indiana.

That's why they use the Ransburg Electrostatic Hand Gun to apply a uniform clear coating on their brass-plated furniture. The protective coating is baked on. Although the bulk of their present production is in the popular brass line, they still paint the metal furniture in a variety of colors with the Hand Gun.



Painting is **CLEANER**
... **QUICKER** ... **CHEAPER**
with the Ransburg Electrostatic
Hand Gun.

These chairs and table
are typical of the Koch
line of metal furniture.



*10 GALLONS OF PAINT NOW DOES THE JOB WHICH FORMERLY TOOK 30 GALLONS

On one item—a TV table—they formerly used 30 gallons of enamel to coat 1000 units by combination dip and air spray method. Now—with the Ransburg Electrostatic Hand Gun, they paint 1000 tables with only 10 gallons. And, they get a better, more uniform coating, too.

NO REASON WHY YOU CAN'T DO IT, TOO!

See how the Electrostatic Hand Gun can save time ... paint ... and cut costs in YOUR finishing department. Or, if your production justifies, it'll pay you to investigate Ransburg's automatic electrostatic spray painting equipment. Write for our No. 2 Process brochures which show numerous examples of modern production painting in both large and small plants.

RANSBURG

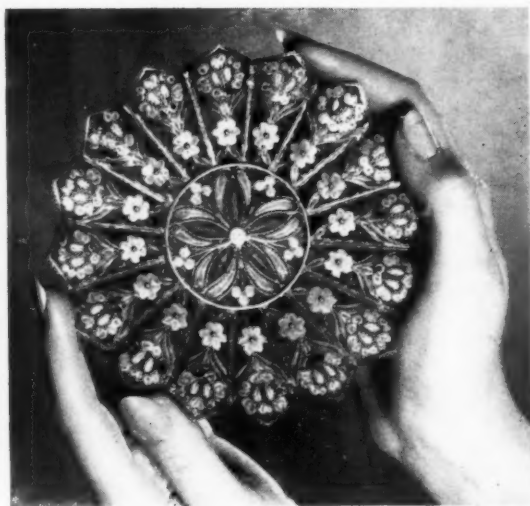
RANSBURG
Electro-Coating Corp.

Box-23122, Indianapolis 23, Indiana



This latter day Nefertite shows some of the uses made of porcelain enamel by the ancient Egyptians. Jewelry, vases, bowls, and other art objects made of porcelain enamel thousands of years ago still retain the lustre and beauty that made them such prized treasures in ancient Egypt.

Porcelain enamel . . .



(Above) — This intricate object d'art, made in Persia centuries ago, is an example of the beautiful jeweled effects created by ancient artisans. In this type of porcelain enameling, Cloisonné, the complete design is first formed with thin bands of metal, and the enamel is carefully poured in.

MANY CENTURIES BEFORE THE CHRISTIAN ERA

IF YOU WERE A PRINCESS of Egypt or Assyria in the days of the Pharaohs, your table setting would have included a number of bright, colorful vases and dishes made of porcelain enamel. You would have marveled at their brilliant colors and sharp outlines, their lustre and beauty, and the way they stayed so beautiful year after year. Today in the museums of the world these same porcelain enamel vases and dishes are still being admired for their lustre and beauty — a beauty that has survived the ages.

From this modest beginning as a decorative art many thousands of years ago, porcelain enamel has spanned continents and the ages, becoming one of the most important materials in our modern life. Because porcelain enamel combines so many desirable qualities in one material, its applications today cover a nearly-limitless range of products. Its use in afterburners of jet aircraft takes advantage of porcelain enamel's ability to withstand intense heat and corrosive fumes. In modern architecture, porcelain enamel provides a colorful finish that will not stain or fade and is easy to clean.

In today's home the modern housewife is literally surrounded by porcelain enamel. From the bath to the kitchen, in bathtubs and sinks, porcelain enamel provides ease of cleaning and protects against harsh detergents and household acids. The wide range of home appliances — ranges, water heaters, washers, dryers, freezers, refrigerators, and air conditioners — that use porcelain enamel demonstrate its remarkable versatility. In some, it protects against heat, corrosion and rust, while in others it protects the appliance from abrasion and freezing temperatures.

Porcelain enamel has many uses in industry

Its many industrial uses include the food processing and pharmaceutical industries where porcelain enamel is used in vats, pipes and reactors because its non-porous surface protects against contact with the underlying metal — prolonging the life of the equipment and insuring a completely sanitary product.

While the origins of porcelain enamel have been lost in the shrouds of antiquity, there are in existence today samples of the art that date its beginning back



Porcelain enamels fortified with special heat resistant materials are used in jet aircraft to protect the underlying metal from intense heat and corrosion.

Porcelain enamel both inside and out protects home laundry equipment from the rust and corrosive action of hot water and harsh detergents. The gleaming color and beauty of porcelain enamel make today's laundry appliances an attractive addition to any modern home-maker's kitchen decor.



...from Egyptians to jets

many centuries before the Christian era. A huge figure of Zeus with flowing robes of porcelain enamel, made either in Greece or Rome, dates the art back to the fifth century B.C. In the British Museum in London, there stands a shield made by the Celts over 2000 years ago. And even after centuries of laying at the bottom of the Thames River it is still a beautiful work of art.

During the Byzantine Empire the art of porcelain enamel flourished and from here it spread into Western Europe. In the tenth century when Otto II, Emperor of the Holy Roman Empire, married the Byzantine Princess Theophanie, she prized the art so highly that she took with her to the German court a group of her own enameleds. Six hundred years later, artisans influenced by these Byzantine enameleds executed for Charles the Ninth of France one of the masterpieces of the art—a two-foot high shield depicting a sea battle in red, blue, and green porcelain enamel on gold. This shield stands today in all its original beauty in the Louvre in Paris.

Also serving to spread the art throughout Europe was the Byzantine Emperors' custom of using jewelry as a means of official communication. When they wanted to remind some tributary king of his subordination to the Byzantine Emperor they often sent him hats or crowns—an insignia of the Emperor's authority. Pictures done in porcelain enamel were incorporated into the crown and carried the Emperor's message. There exists today part of a crown, found in Hungary, that had been sent by the Emperor Constantine Monomachus to the King of Hungary in the eleventh century. On this crown a picture of the Emperor and his many virtues had been executed in porcelain enamel—probably to remind the king of his subordinate position.

Fifteenth century the turning point in application

Until the fifteenth century, porcelain enamel was applied by one of two methods—Champleve, in which a design was cut into the metal and the enamel then put into the hollows, or Cloisonne, in which a design was formed by small metal bands soldered on a metallic background and then filled in with enamel. Artisans in Limoges, France, at the end of the fifteenth century, discovered that enamel would adhere without the use of hollows or bands to hold it if the metal were completely covered with enamel and then fired. A base coat of

enamel was applied with a brush and then any design that was desired was simply brushed over it in successive layers.

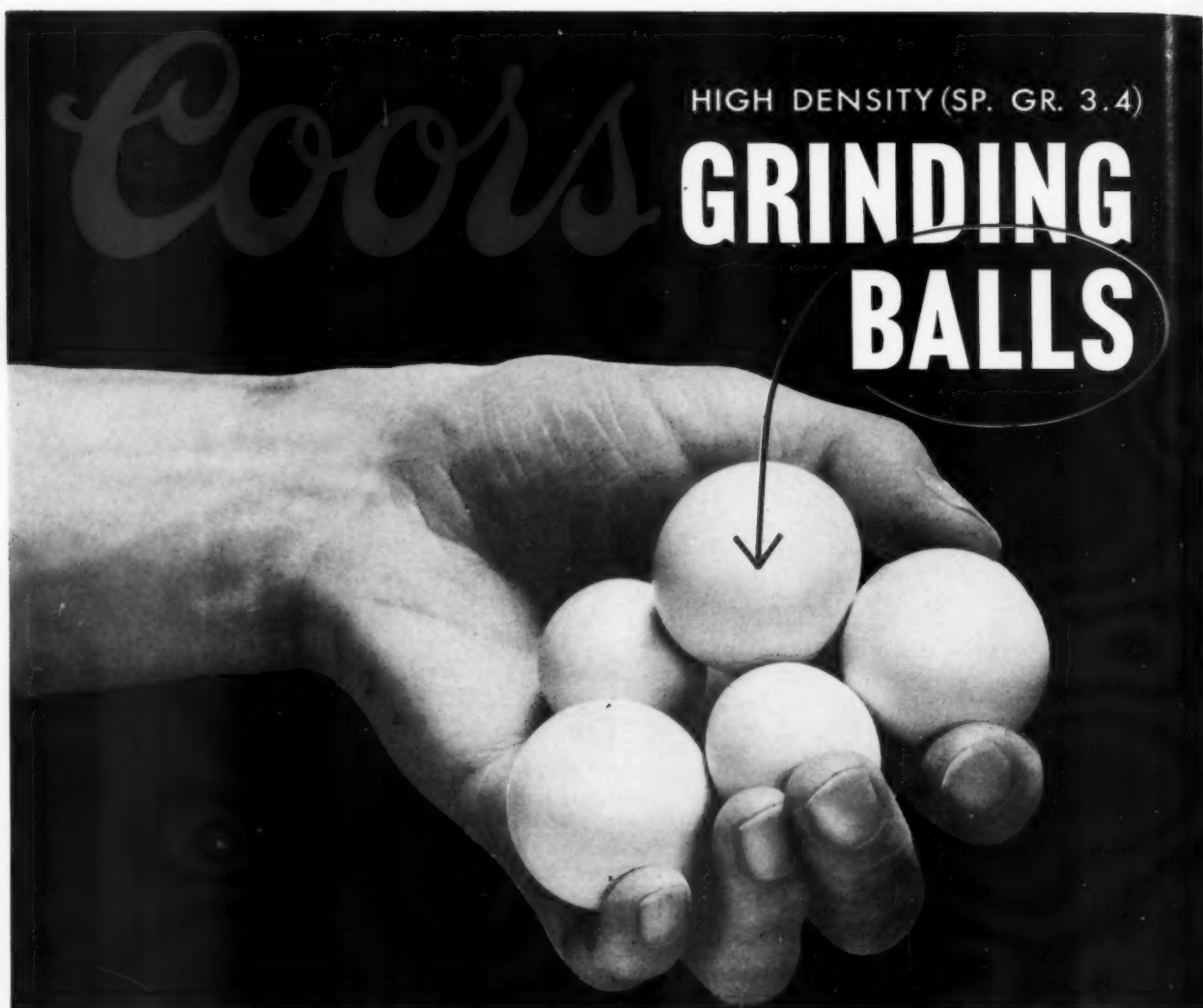
With enamel now being brushed on, the size of the object to be enameled

to Page 68 →

While porcelain enamel has become a giant industry, it has lost none of its allure for today's artist. Because of the unlimited range of colors and scope of design, decorative accessories in porcelain enamel such as this "Egyptian" wall plaque compliment any decor.



heat resistant. In many cases, the use of ceramic coatings protect more than doubled the life of afterburners and combustion chambers in jet engines.



"Here at Tennessee Stove Works, we began using Coors High Density Alumina Ceramic Grinding Balls at a time when we were adding many colors and different types of enamel to our line. With the Coors High Density Balls, we cut our grinding time from 7 and 8 hours to 4 and 4½ hours. We were able to meet our schedule without additional mill room equipment. We list the advantages we experienced as follows:

"1. We eliminated the excessive amount of unground frit.

"2. The milled enamel is discharged

from the mill cooler, which enabled us to obtain a more uniform set.

"3. No balls are added with each mill charge, as was the practice with the conventional balls.

"4. Coors High Density Balls wear evenly, eliminating the necessity of dumping the mill to inspect and scrap the out of round and broken balls.

"5. Maintenance cost on mills went down because we eliminated the extra grinding time.

"6. Grinding time was reduced approximately 43%.

COORS PORCELAIN COMPANY

Manufacturers of High Density Grinding Media and Mill Liner Brick

IMPROVE *milling operation*
LAST *longer*
REDUCE *mill maintenance*
CUT *grinding time 43%*

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"After our experience with Coors High Density Balls, we are glad to express our opinion on a product which has done much for us."—*R. H. Caldwell, Vice President, Tennessee Stove Works, Chattanooga, Tenn.*

All Coors Grinding Balls and Mill Lining Brick are formed by the ISO-STATIC PROCESS which makes it possible to produce these thick sections without voids or air pockets and without internal drying stresses. This means that these Coors products are just as hard and wear resistant at the center as at the surface.

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199



(Right)—Ease of cleaning and simple operation highlight the features of the Deluxe 30-inch electric range. Plug-out units that come completely out, oven heating elements that can be removed, and a lift-off door make cleaning the range a simple matter. The control panel features dial-type controls that give the homemaker any degree of heat she wants. A special feature of the range is the Serv-Temp Roast Guard. This device shuts the oven off when a roast or other meat is finished, and will hold it at the desired degree of "doneness" for several hours with no loss of flavor or juiciness.



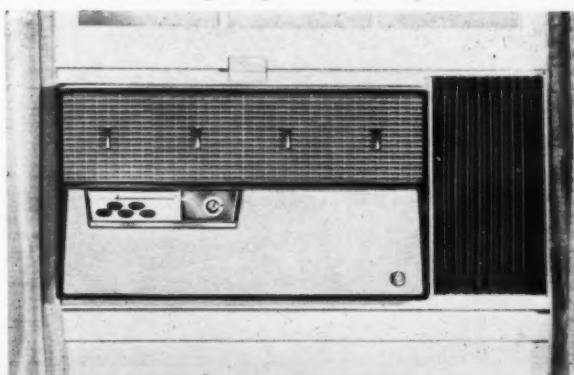
Fresh meats, including hamburger, can be kept without freezing for seven days in this new refrigerator with the exclusive glide-out center drawer. Vegetables are also kept in the drawer under ideal humidity and temperature conditions. The drawer is a new feature in the 1960 Westinghouse line, adding convenience and economy.

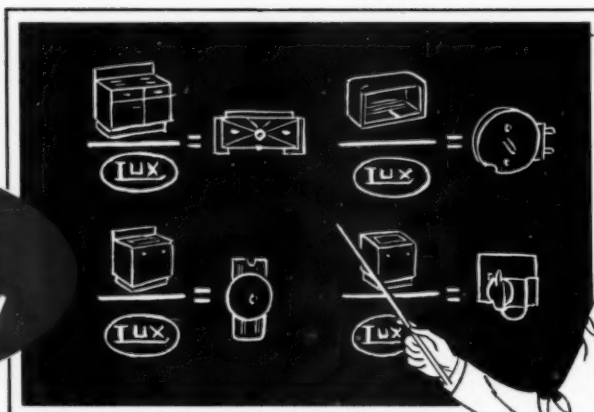
New 1960 products by Westinghouse



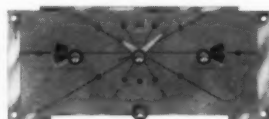
(Left) — A natural addition to any workshop is this dehumidifier. Capable of removing up to 33 pints of moisture from the air in 24 hours, a dehumidifier can prevent tools from rusting, keep wood dry, and make the workshop a more pleasant place in which to work. An automatic control regulates the amount of moisture being removed, and the unit will automatically shut off when the desired conditions are reached.

Wide choice of comfort conditions, as well as flexibility of use, are featured in the Custom Mobilaire series of room air conditioners. Temperature and humidity conditions are available as desired at the push of a button. For easy reading, pushbutton controls are mounted in a slanted position. A completely assembled installation kit makes it a simple matter to install the unit in a window, or remove it for use on its own portable Mobilcart. The Custom Mobilaire series, and the Presidential Mobilaire and Custom Heavy Duty units, are equipped with a newly-designed air flow system.





The Common Denominator in solving Appliance **TIMER** Problems



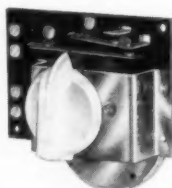
5866 SERIES: New, fashionable *slimtrim* model. Combination fully automatic Range Timer and one hour electric Minute Minder. Exclusive bell chime reminder signal. Custom designs available.



2500 SERIES: Spring wound all purpose mechanical timer, single pole, single throw, normally open switch. Time range 15 minutes to 4 hours. Approved by U. L. & CSA.



1600 SERIES: Dryer Minder Timer with time cycles of 15, 30, and 60 minutes. Single pole or double pole switch. Single stroke bell signal one of several optional features.



7000 SERIES: New, improved Dryer Timer. 25 amp., 230 v heater rating; 1/3 H.P., 115 v motor rating; AC only. Approved by U. L. and CSA. One piece shaft assembly ensures alignment and prevents loosening.

Different appliances are designed for different duties . . . but in virtually all of them a reliable, accurate timer is commonly indispensable.

And Lux, as one of the nation's leading timer manufacturers, works constantly to produce new products that will meet the appliance world's continuing demands for improved design and performance.

Now more than ever before, makers of ranges, rotisseries, washers, toasters, refrigerators, air conditioners and similar equipment look to Lux for quality construction and dependable performance that's backed by years of experimental research and development. Look at these four timers from the diverse Lux line . . . and let us know if you want more information on them . . . and on other Lux models, too. Remember—Lux . . . first . . . for lasting time, *and* for lasting customer satisfaction.

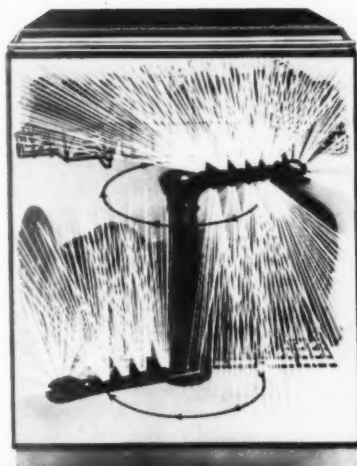
LUX...first...for lasting TIME



THE LUX CLOCK MANUFACTURING COMPANY, INC. • 95 JOHNSON STREET • WATERBURY, CONN.



The space-saving Universal drop-in electric oven and range, which fits into a two-square foot area, comes in a choice of white or five decorator colors. Added flexibility is provided by removable panels which allow it to be random-mounted in the center of a counter or at either end. A Roast Guide is available on the Imperial models, providing automatic control of the large oven.



The new water distribution system assures improved washing and increased capacity, as well as permitting "random loading." The water action of the "Z" arm in the new Imperial models is illustrated here. A powerful pump forces water through scientifically-located openings on the rotating arm to power it into all corners of the upper and lower baskets.



In this view, homemaker is activating pre-wash cycle on Imperial model which rinses dishes prior to accumulation of a full load — before sticky foods can adhere. Incorporated in the line of nine Universal dishwasher-dryers are built-in, convertible, convert-table, and portable units.

more new products on succeeding pages

New 1960 products by Waste King Universal



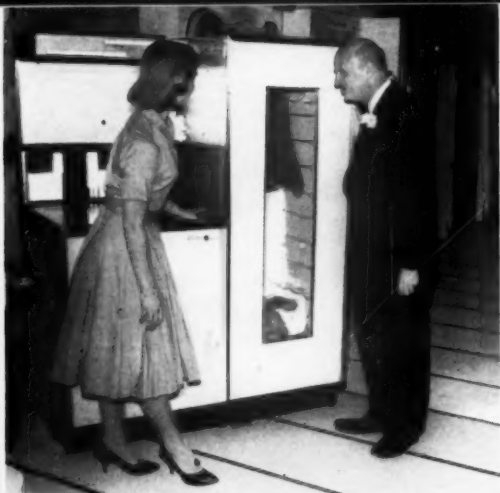
(Left)—A gas kitchen featuring the Universal built-in oven and range is shown here.

(Right) — A new line of large-capacity Universal portable dishwasher-dryers, with a unique system of water distribution, holds a conventional place setting of 15 in the Imperial and 13 in the Custom models.



Steel settlement

AN MPM STAFF REPORT



R. C. Sandin, manager in charge of industrial design at Hotpoint, explains company's experimental washer-dryer including vertical dryer.



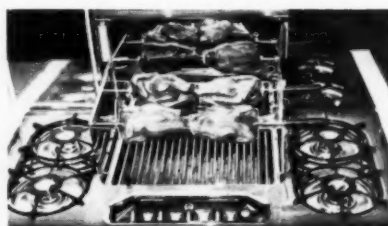
(Above)—O'Keefe & Merritt General Sales Manager Al Cramer and the company's free-standing gas range and oven.

ONE DARK CLOUD hovering over the appliance and metal products industry blew away during the winter International Home Furnishings Market in Chicago, January 4-15, but another cloud, hung on a question mark, came into view.

Enthusiasm generated by the introduction of new models and glowing forecasts for the "Soaring Sixties" had been somewhat tempered by the deadlocked steel negotiations. Then, as a fitting christening for the opening of the market, the steel settlement was announced. When the terms of the agreement were learned, however, price in-

creases and inflation became the topic of the hour. The general feeling among manufacturers was that there will be no unusual price increases for several months, and when the increases do come, they should not be of great proportions. But what the price picture will be in six months or a year as a result of the new steel contract hinges largely on the degree of nation-wide inflation.

But the optimism for the 1960 appliance market was not measurably dampened by the hints of inflation. While few industry leaders hold hope for equalling the sales gains made in 1959, it is generally felt that 1960 will



Another O'Keefe & Merritt product shown at the market—a gas range with built-in ceramic barbeque.

(Below)—The built-in Exhaust-O-Vent system on the Tappan Co. 40-inch built-in oven is pointed out by District Manager Ross Sams. The unit shown is one of the models available in the Tappan Fabulous 400 line.



(Below)—Harold E. Martin, national sales manager for the Mfg. Co., holds plug and hose connection for the KitchenAid.



entcheers market crowd

show a comfortable rise in appliance sales. (see "Forecasts," January MPM)

That the appliance industry has faith in 1960 was demonstrated by the multitude of new models and new products set up in the Merchandise Mart, the American Furniture Mart and Chicago hotels. Some of the "dream" appliances were on exhibit to learn dealer reaction. Other lines are already in dealers' showrooms and many more will go on the market shortly. (Some of these products were presented in January MPM, and more will be found on pages 41, 43, 47, 48, 49 & 51 of this issue.)

There were 1100 shows in the Mer-

chandise Mart alone, and the crowd of buyers and sellers was estimated at 40,000, which is 5,000 more than last year's attendance.

New Kelvinator policy

One of the big stories coming out of the market was an announcement by B. A. Chapman, executive vice president and general manager of the Appliance Division of American Motors Corp., that Kelvinator Division will no longer introduce new appliance models on an annual basis. According to Chapman, new models "will be introduced as soon as they are ready, after adequate research, engineering and consumer testing have determined product usefulness, dependability and salability."

Chapman predicted the new policy will benefit consumers, dealers, distributors and manufacturers. Cost savings will be realized by reducing the frequency of re-tooling just for the sake of change. These savings will be applied to the design and manufacture of lasting improvements, Chapman said.

Waste King Universal debut

The market also saw the debut of the first line of products marketed by the new Waste King Universal sales organization. The line includes nine automatic dishwasher-dryers, an electronic oven, ten built-in gas and electric ovens and ranges, and a flexible drop-in cooking unit. All products will be available by June, except the electronic oven, which is scheduled for September distribution.

Waste King acquired operating control of Cribben & Sexton, manufacturer of Universal cooking products, in February, 1959. Betram Given, president of Waste King Universal, predicts the efforts of this marketing organization combined with the company's growing Technical Products Division will account for a record sales volume of more than \$50 million during the fiscal year ending March 31, 1961. Sales volume for the current fiscal year is estimated at 36 million.

s man the KitchenAid Home Dishwasher Div., Hobart
connect KitchenAid's new convertible dishwasher.



EXCLUSIVE MPM PHOTOS



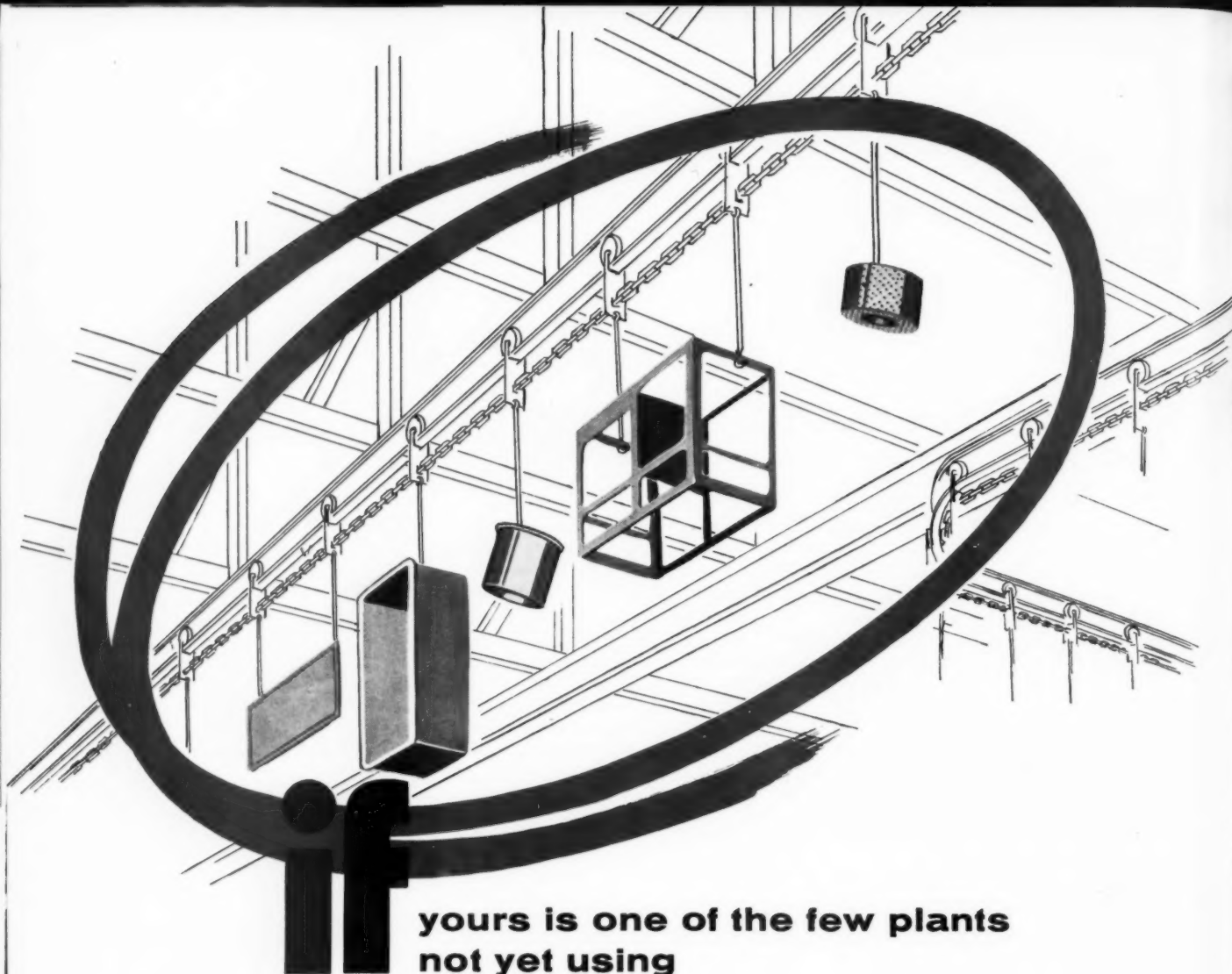
President Fred Maytag II and The Maytag Co. "Top-of-the-Line" combination washer-dryer. Maytag also showed a single-control washer.



(Above)—One of the top models of Dixie Products, Inc., for 1960 is the Top-of-the-Line Model 460-9CE0 electric range. Standing by the unit is Marvin Rymer, VP sales.

(Below)—Philip R. Brooks, sales manager (left), and President S. W. Weiger of Woman's Friend Washers show one of their top new models.





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The "Partio Cart" is a complete outdoor cooking center on wheels, and has a complete range, built-in charcoal cooker, and drop-leaf centers for serving buffet style.



The 30-inch J-304 free-standing range is in the medium-price bracket, and includes the Sensi-Temp automatic surface unit. Called the Spacemaker, it also includes deluxe automatic oven timer, standard and timed appliance outlets, and push-button surface unit controls and oven switches. The 23-inch Master oven has a focused heat broiler.



New 1960 products by General Electric

(Above) — The Sensi-Temp automatic surface unit is a feature of the new deluxe double oven range. Other features are: dial control and temperature guide for the Sensi-Temp unit; "Dinner Dial" oven controls; automatic oven timer; a 23-inch Master oven and 16-inch Thrift oven; and automatic rotisserie and meat thermometer.

(Left) — The built-in range line features the Mark 27 one-piece range. It has a 21-inch oven, four surface units, and a recessed cooktop, and can be set into a standard countertop between base cabinets, either regular or custom-made.

(Right) — The Frost-Guard freezer prevents frost-coated food packages because frost never forms. Freezer defrosts itself completely and automatically every twenty-four hours.



New 1960 appliances

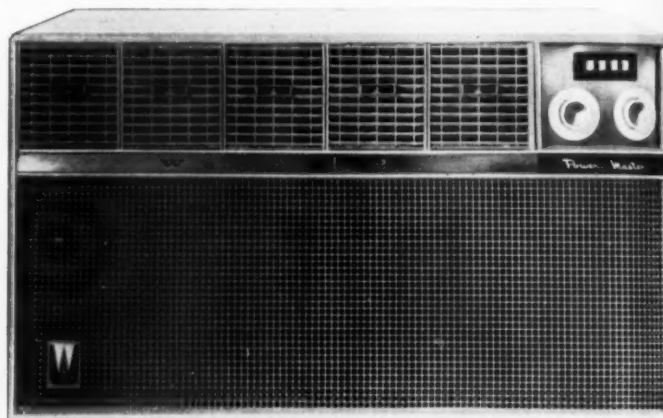
a roundup of new products for the current market

more photos on page 51



(Left) — The fully undercounter Duomatic combination washer-dryer by Philco permits full running counter surface, and installation is said to be as simple as an undercounter dishwasher.

(Below) — Powermaster one-hp air conditioner by Welbilt Corp. cools up to 675 sq. ft., and fits flush in windows or through the wall. The unit is only 16 inches in depth, has an automatic thermostat, two-speed fan motor, and lifetime removable filters and adjustable air deflectors.



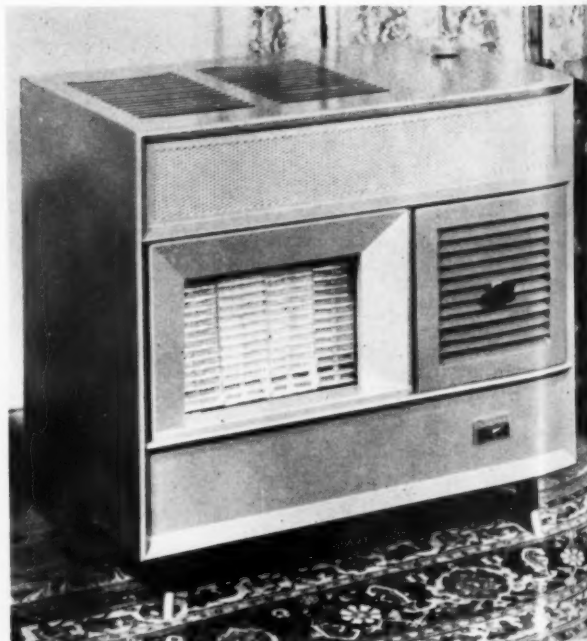
(Right) — Closeup of thermostatic surface unit control. Dial in backguard, which can be set for temperature from "warm" through "fry," controls right front cooking unit. Automatic sensing unit maintains dialed degree of heat.



(Left) — Model #460-9CEO electric range by Dixie Products, Inc. combines attractive design and luxury features. Automatic clock simplifies clock-controlled cooking, using two dials.



(Right) — A thin-line furniture-styled gas space heater that properly balances radiant and circulated heat is manufactured by Heil-Quaker Corp. Among other features, a four-directional louvre permits the heat flow to be directed to floor level, living zone, to left or right.



(Right) — The roto-roaster rotisserie in this 17-inch Imperial gas built-in oven by RCA Whirlpool automatically cooks many delightful dishes to a turn. Ka-bob and Roto-Baste are optional features. Two-set automatic clock starts and stops baking or broiling automatically.

(Left) — Modern, square-design freezer by Maytag is said to be ideal for homemakers who want flush-to-wall, flush-to-cabinet, or built-in installation. Three upright freezers, specially designed for such installations, feature an air-cooled refrigerant system that provides air flow through a grill at the front of the unit.

(Below) — The New Look range by Crown Stove Works is a free-standing unit that looks and fits like a built-in, and has a satin-chrome cover that recesses into the top, making it flush with standard 36-inch high kitchen cabinets. No controls mar the surface of the front, and top burner controls are recessed at one side of cooking surface.



(Below) — The Matre D' built-in unit by Roper is a gas surface model rotisserie that is ideal for installation in recreation room, patio, or barbecue cart. Broiling and barbecuing are done by concealed twin gas burners that emit penetrating radiant heat and no exhaust system is necessary. Spit is motor driven.



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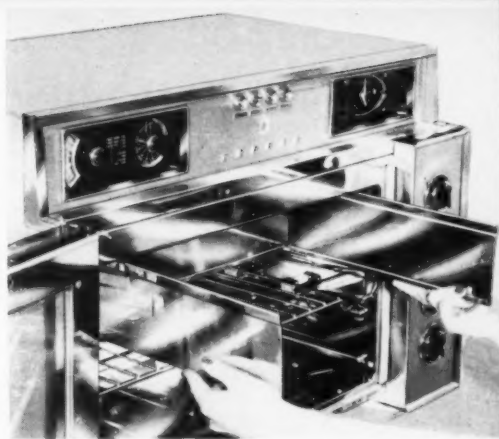


INGRAM-RICHARDSON INC. OFFICES, LABORATORY AND PLANT, FRANKFORT, INDIANA

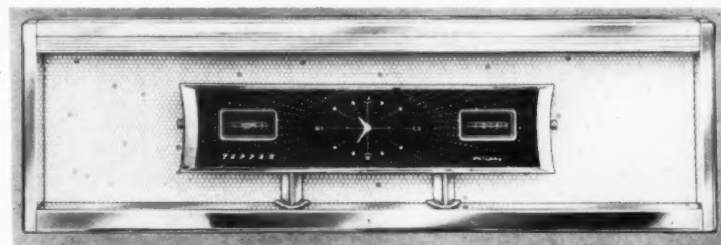


This 36-inch gas range incorporates an aluminum Thermogrid griddle, which is built into the divided main top. It has a heat indicator to assure correct cooking temperatures, and a removable grease well for easy cleaning. The Visualite door with honeycomb glass window lifts out for cleaning.

(Right) — This removable chrome-lined broiler shield is standard equipment on deluxe Four Hundred and built-in electric ranges with the chromium oven lining. The shield prevents grease from spattering on oven walls near the broiler element where it would burn onto the oven lining. When not in use, the shield can be stored in a cabinet.



(Below) — Shadow box backguard features honeycomb-patterned back panel on the 1960 line of free-standing ranges. Tel-U-Set control panel places all instruments at fingertips. Fluorescent bulb in top of backguard floods light on instruments and cooking top.



New 1960 products by Tappan



(Left) — This Holiday model has a 24-inch oven that will accommodate a complete meal for several people. The range is equipped with Sizzle 'N Simmer burners, a Vari-Flame Set 'N Forget, pull-out broiler with chromium broiler tray, and many other deluxe features.

(Right) — Model 441 of the Fabulous 400 electric range line has double Visualite ovens with dark blue porcelain oven linings at a convenient reach-in height. The wooden cutting board and four-in-line top units slip out of the way in the Hide-a-way cooking top. There is also a Set 'N Forget, thermostatically controlled top element.



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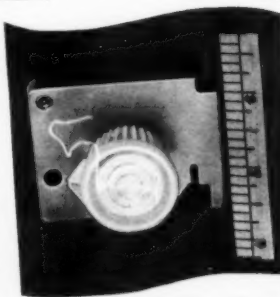
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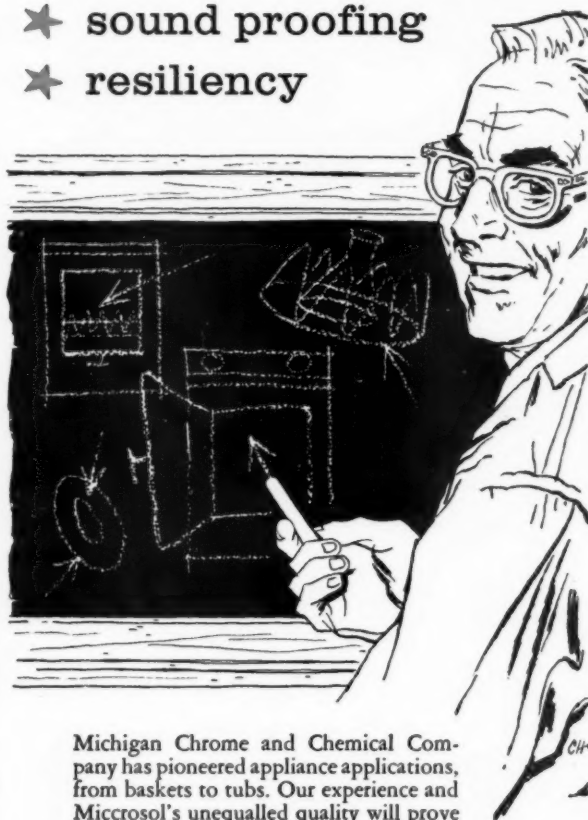
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IN MARCH, 1958, after extensive and protracted field and laboratory testing to prove the value of such a move, Waste King Corporation, Los Angeles, California, began using a plastisol coating on the interior of the tanks and doors for their extensive line of home-type automatic dishwashers. The first major move in this changeover program was to provide additional factory space for the plastisol finishing line. This was accomplished by a building addition which now contains the automatic cleaning and phosphatizing equipment, a dip tank for the plastisol primer, and a piggy-back bank of two- and three-pass ovens for the drying and baking processes involved.

The 12-foot paint booth where the plastisol finish is applied, and loading and unloading space for the 700-foot continuous overhead conveyor, which links all processing facilities, are located in the original factory building in space adjacent to the new addition. In this way, the tanks and doors can be loaded on the conveyor almost directly from the fabricating line, and end up in the completely-finished condition very near the beginning of the final assembly line. This arrangement greatly minimizes in-process handling.

Application of the plastisol finish, a polyvinyl chloride-type material, does not differ greatly from the application of other baked organic finishes, except for process details. The tanks and doors



Photo shows tooling for hanging dishwasher tubs on the conveyor line.

Applying plastisol coatings at Waste King



are loaded on the overhead conveyor from the production line and are not removed (except for dipping in the primer tank) until they are finished and ready for final assembly. Conveyor speed is $3\frac{1}{2}$ feet per minute throughout.

From the loading station, the parts move into the new building addition, and thence to the automatic combination cleaning and phosphatizing facility. This

All eight models in Waste King's new DeLuxe dishwasher line feature special "pre-wash" and "pots & pans" cycles which make it unnecessary to hand scrub even sticky dishes and crusted cookware.

straight-line unit is approximately 60 feet long overall, is gas-fired, and completely automatic in operation. The first four stages comprise a conventional cleaning setup consisting of an alkali cleaner, rinse, phosphoric acid pickle, and rinse. The final five stages, employed for phosphatizing, include the following: zinc phosphate, rinse, rinse, chromic acid rinse, and de-ionize rinse. This facility is supplemented by an adjacent water de-ionizing unit which de-ionizes all water in the final rinse stage.

Parts then move through a short oven for dry-off; then onward to the primer dip tank. Here the tanks are momentarily unhooked from the conveyor while

they are lowered for dipping. From the dip tank, they move onward to the lower portion of the piggy-back oven bank and through a two-pass oven where the primer is dried and baked at 300° F. Travel time through this oven is approximately fifteen minutes.

The parts then move back into the original building and through the paint booth where the plastisol coating is applied by hand spraying. As already noted, only the interior portion of the tank is given a finish coating. This is accomplished by several spray guns with different nozzle configurations, which simplifies coating application in recesses and retro-curve areas.

The plastisol material is purchased in 50-gal. steel drums, and sprayed "as is" except for prior stirring. No thinners or solvents of any kind are required. Pump units attached directly to the 50-gal. drums provide the necessary spray pressure. The material is applied at room temperature, and no specific environmental controls are necessary. Final plastisol coating thickness is between 10 and 12 mils.

The paint booth used employs a system of slotted baffles at the rear which stops a large percentage of the overspray. The overspray particles then drop into a trough. When the trough accumulation becomes great enough, the plastisol material is removed, re-mixed, and can be used again. Loss from overspray is greatly minimized by this method.

Waste King Corp. officials point out that, to date, the plastisol coating material has proved entirely safe to spray

(Right) — Spraying a plastisol coating on the interior of a dishwasher tub.



(Below) — Dip priming washer components prior to plastisol application.



booth operators. Not even a skin rash has appeared during the nearly two years of its use.

From the spray booth, the plastisol coated parts move back into the building addition and through the three-pass upper portion of the piggy-back oven bank. The Waste King oven was especially designed to do an efficient job of plastisol curing, since recirculation and volume-exhaust requirements are considerably different for a plastisol curing oven than for a conventional paint oven. Here, the coating is baked for 30 minutes (including rise-to-temperature time) at 375° F. From this oven, the completely finished parts move back in-

to the original building and are unloaded from the conveyor adjacent to the beginning of the final assembly line.

From the production standpoint alone, Waste King officials point out that the plastisol coating has several specific advantages. To begin with, it can be applied over ordinary cold rolled steel, eliminating the cost of special steels. From the design standpoint, there is no limitation on the sharpness of radii or other design configurations. The inherent flexibility of the plastisol coating material covers effectively, regardless of the shape of the surface on which it is applied. From the handling standpoint, this inherent flexibility of the coating results in very few part injuries during final assembly, crating, and shipping of the finished dishwashers.

Waste King reports that very few rejects occur during finishing. When a part must be rejected, the coating is softened with a solvent, then re-sprayed. Stripping of the original coating is not necessary. Localized repair of the plastisol coating, after finishing, and even after the product is in service, can be easily accomplished. The surface characteristics of the plastisol coating cause it to resist abrasion and surface scars which might affect its final appearance.

As the plastisol coating never dries brittle-hard, it has an acoustic value in that it minimizes operational noises of the finished product. At the same time, its chemical inertness and its impervious surface structure minimize the possibility of dirt accumulations and bacterial growth. Waste King officials point out that it is extremely easy to keep entirely sanitary at all times insofar as its application in automatic dishwashers is concerned.



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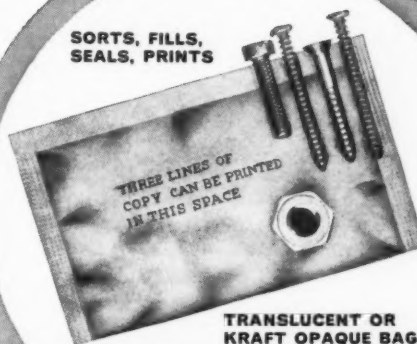
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- ☐ Please send me any available information or literature.
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Company _____

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MAC CHEM

1-2 CLEANING PROCESS for ENAMELING

for High Quality PORCELAIN ENAMELING

**IT'S A HIGH SPEED CLEANING PROCESS
THAT CLEANS SO IT STAYS CLEAN**



In enameling, there's nothing so costly and disheartening as rejects. If you are faced with this difficulty—due to unclean metal parts — Mac Chem 1-2 Enameling-Cleaning Process can be of an infinite help.

While we do not claim that Macco Cleaner and Cleaning Process will entirely eliminate all rejects, we do maintain they will reduce them to minimum.

1 Mac Clean No. 20 is a Heavy Duty Cleaner specifically designed to remove all special enameling drawing compounds, etc. It is a fast, easy-to-use, economical cleaner — non-toxic, non-corrosive, and non-injurious to metals.

2 Mac Chem No. 30 is a Second Step, Light Duty Cleaner which removes all residue from the cleaner baths, leaving the metal so chemically clean that it stays clean and readily accepts acid pickle and nickel.

FOR QUICK RESULTS

Write or phone Macco today and have a Macco engineer make a demonstration in your plant. No obligation, of course.

This 2-Stage Metal Cleaning System is serving some of the country's largest porcelain enameling plants. Can be used with equal effectiveness in both automatic and batch type equipment.

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PRODUCTS
COMPANY

Manufacturers of Better Metal-Working Compounds since 1931
9210 SOUTH SANGAMON STREET • CHICAGO 20, ILLINOIS • PRESCOTT 9-0800

NEWS



Welbilt Buys American Coils

Welbilt Corp., Maspeth, N. Y., has acquired the business and assets of American Coils Co., Farmingdale, N. J. The acquisition was made in exchange for Welbilt common stock.

Alexander P. Hirsch, Welbilt chairman, said Michael Pacaro, American Coils president, will continue as president of the Welbilt Air Conditioning & Heating Corp., a newly-formed subsidiary of Welbilt, set up to conduct an expansion program.

KitchenAid Sales Up in 1959

Sales of KitchenAid home dishwashers were up 30 per cent in 1959 over the previous year, and 60 per cent ahead of 1957 sales, according to sales manager Harold E. Martin. KitchenAid dishwashers are manufactured by Hobart Mfg. Co., Louisville, Ky., where a large plant addition was recently built.

Fedders Air Conditioners To Be Made in Italy

Fedders Corp., Maspeth, N. Y., has licensed Rheem Safim, an Italian affiliate of Rheem Mfg. Co., to manufacture the Fedders line of air conditioners. Production is expected to begin by June.

Fedders also has licensing agreements with firms in India, Canada, and Brazil. The Fedders line includes window and central air conditioners.

Maytag Ups Production, Announces New Plant

The Maytag Co. has increased production of automatic washers and combination washer-dryers and added approximately 140 persons to its payroll.

The company also announced the beginning of construction of a 22,314-sq. ft. building which will serve as the new headquarters for the company's Minneapolis branch. The new structure, which will house office and warehouse facilities, is in St. Louis Park, a southwest suburb of Minneapolis. Completion is scheduled for early summer.

Norge Ships 900,000 Units In 1959—33 Year Record

Domestic factory shipments of Norge home appliances in 1959 exceeded 900,000 units, a record for any year in the company's 33-year history. According to Judson S. Sayre, president of the Norge Div. of Borg-Warner Corp., volume was near \$120 million—a 29-per cent increase over 1958. He said the 900,000 mark is "An excellent plateau from which to jump over the one-million-unit mark in 1960."

Hupp Shortens Division Names

The shortening of divisional names has been approved by Hupp Corp. directors in a move to better identify the operating divisions with the corporation. The divisions whose names were changed are: Gibson Refrigerator Div. (formerly Gibson Refrigerator Co.); Hupp Aviation Div. (formerly Hupp Aviation Co.); Perfection Div. (formerly Perfection Industries); Typhoon Air Conditioning Div. (formerly Typhoon Air Conditioning Co.); and Typhoon Heat Pump Div., (formerly Typhoon Air Conditioning Co.).

Westinghouse Stock Split

Stockholders of Westinghouse Electric Corp. approved a two-for-one stock split of the common stock at a special meeting at the Westinghouse research laboratories in Pittsburgh on January 4.

The split was recommended by the board of directors at the Oct. 28, 1959 board meeting, when the quarterly dividend was raised from 50 cents to 60 cents a share on the old common stock after the company reported the highest third quarter earnings in its history.

New Name for Paint Federation

The official name of the Federation of Paint and Varnish Production Clubs has been changed to the "Federation of Societies for Paint Technology." The change became effective Jan. 1, 1960.

NEMA Adds Six Members

Six companies have been added to the membership rolls of the National Electrical Manufacturers Association. The new members are: Ripley Co., Inc., Middletown, Conn.; Northeastern Engineering, Inc., Manchester, N. H.; Texas Instruments Inc., Attleboro, Mass.; Gas Drying, Inc., Chatham, N. J.; International Instruments, Inc., New Haven, Conn.; and Hindle Transformer Co., Inc., Flemington, N. J.

Vacuum Cleaner Sales

Sales of standard-size domestic-type vacuum cleaners for the month of November, 1959, were 290,130 units compared with November, 1958 sales of 293,609—a decrease of 1.2 per cent.

For the 11-month period, with unit sales for the current year of 3,127,082 compared with 2,978,082 for the previous year, the increase was five per cent.

Admiral Forms New Sales Corporation

The formation of a separate subsidiary, Admiral Sales Corp., for conducting the sales, service, advertising, and promotional activities for all Admiral consumer products was announced recently by Ross D. Siragusa, president of Admiral Corp.

Carl E. Lantz has been elected president of the new corporation. One of his first acts will be to double Admiral's present staff of merchandising specialists which works in the field with distributors and dealers.

"The new sales organization marks the culmination of years of planning," Siragusa said, "to further strengthen the company's marketing operations. This move, we believe, will help us attain our projected goal of a 50-per cent sales increase over the next two years."

Products to be handled by Admiral Sales Corp. include all the electronic and appliance lines, as well as the commercial electronics and national service divisions. Government electronics will continue as an operation of the parent company.

Admiral has 82 distributors throughout the country, 40 regional sales managers and field engineers, and approximately 500 distributor salesmen.

Other officers of the newly-established corporation include: Ross D. Siragusa, Jr., vice president, electronics division; B. H. Melton, vice president, appliance division; and Harris Hesketh, vice president, branch distributing division.

Lyon to Equip New West Coast Plant

Lyon Metal Products, Inc., Aurora, Ill., manufacturers of over 1500 steel equipment products for business, industry, institutions and homes, has announced the purchase of a manufacturing plant on the West Coast. Lyon also operates a manufacturing plant at York, Pa. The West Coast plant covers 160,000 square feet and has sixteen acres of land for expansion. It is located 18 miles from downtown Los Angeles.

The report states that the Los Ange-



ALL SIGNS POINT TO USE OF LEAD

All these attractive signs are aluminum or aluminized steel, enameled with a lead-bearing porcelain enamel. They're quite an improvement over the signs of 10 years ago... more colorful, more weather-resistant, and much lighter in weight. Like many other products in today's living, lead has been instrumental in their development.

Lead lowers an enamel's melting point, allows it to be fused onto aluminum at temperatures low enough so that the aluminum remains stable. Lead makes the enamel flow smoothly and set in a thin

acid-resistant, comparatively-elastic surface. It can be cut, sheared or punched after fabrication with little or no spalling or chipping. Lead adds brilliance to a wide range of colors, reflecting in appearance its superior quality.

Why don't you too investigate the cost-saving advantages of lead compounds for your products? More facts are available in an informative booklet called "Lead in the Ceramic Industries." We'll be glad to send it to you without charge. Why not write for it today?

1963



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Lead Industries Association

60 East 42nd Street

New York 17, N. Y.

ENAMELS
GLASS
GLAZES
COLORS
BODIES

les district sales staff and warehouse operation will move immediately into the new Lyon offices, which are a separate part of the acquisition. The complete equipping of the new plant with manufacturing and finishing machinery will require about a year. It is expected that the manufacture of major product lines will start late in 1960. The new plant will serve as a West Coast warehouse in the interim period.

Wyandotte Completes Expansion

Wyandotte Chemicals Corp. has announced the completion of its Atlanta, Ga., plant expansion program. Production of the complete line of J. B. Ford Div. cleaning products has recently begun, according to Ford Ballantyne, Jr., Wyandotte vice president and general manager of the J. B. Ford Div.

Wyandotte manufactures products for metal cleaning and metal finishing, building maintenance cleaning, commercial laundries, etc.

Raytheon Forms New Division

A new division of the Raytheon Co. consolidates government and industrial electronic equipment service and support. Designated Electronics Service Div., the new division is working toward the consolidation of service and support responsibility in each geographical area to provide unified service.

Principal components of the new division are the company's Government Services Div., the commercial marine and communications service sections of the Equipment and Systems Div., and the Industrial Apparatus Div.'s service functions for products such as the Radarange microwave oven. O. L. Dewey, manager of the Government Services Div., has been named to head the new division.

New Course in Welding to be Offered at Stevens

A new course in "Welding Processes" will be offered by the Industries Training School at Stevens Institute of Technology during the 1960 spring semester, it was announced by its director L. Edwin Backer.

The course is intended for men who wish to upgrade their positions in the appliance, electronics, metal fabrication, and related industries. Included will be lectures on brazing; resistance welding; manual, semi-automatic, and automatic arc welding; metal and carbon electrodes; and a detailed study of the physics of arc welding. Demonstrations will supplement the lectures, and students will be encouraged to discuss

practical problems they have encountered while working in industry.

The course will be given Wednesday evenings from 6:50 to 9:20 starting February 10. Further information may be obtained by writing Professor Backer at the Industries Training School, Stevens Institute of Technology, Hoboken, N. J.

Pemco Enlarges Offices

Expansion of office space at Pemco Corp. will give the company 14,000 square feet of space in its recently-constructed building. Financial, purchasing and executive offices, as well as the entrance lobby, will be located in the new building. The work is expected to be completed in the spring of this year.

Industrial Control Computer Built by Westinghouse

A new industrial control computer has been announced by the Westinghouse Electric Corp. The company says the computer's speed, input-output capacity, and memory can be precisely matched to the needs of a particular process by the addition of semistandard "function-modules." It also will be, according to the company, sufficiently versatile for use in general industrial applications, and sufficiently rugged for use in industries with severe environmental conditions, notably the chemical and steel industries.

Dr. R. L. Bright, project manager for development of control computer systems, has said that the basic computer

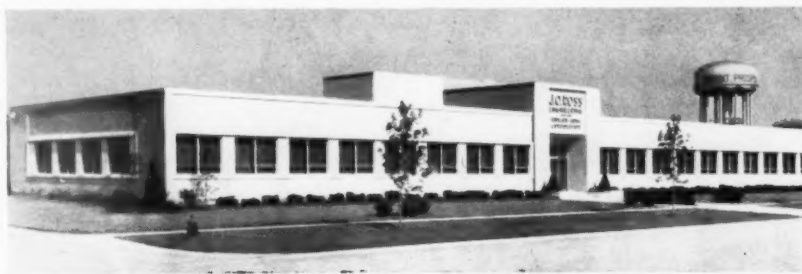
Ross Engineering Div. Holds Open House

J. O. Ross Engineering Div., Midland-Ross Corp., was host to customers and suppliers recently in their new office building in Wevers Industrial Park Area of Mt. Prospect, Ill.

The 12,500 sq. ft. building affords three times as much space as the former office in the Chicago Loop and the site provides space for future building expansion. Headed by Vice President L. G. Janett, the new office serves the terri-

tory bounded by Canada, the Gulf of Mexico, the Rockies, and the Middle Eastern States. The main office of Ross Engineering is in New York City, with manufacturing plants in New Brunswick, N. J., Boston, Mass., and Los Angeles, Calif.

J. O. Ross Engineering Div. designs and manufactures heating, drying, and curing equipment for the finishing, metal fabrication, and other industries.



Regional managers and home-office executives of Ross Engineering Division met recently in Cleveland, Ohio, to discuss company plans for the future. In the photo, from top of table clockwise, are W. K. Metcalfe, vice president, sales; H. G. Rappolt, vice president, engineering, in charge of New York office; C. R. Herter, manager of Detroit office; B. R. Andrews, manager of Andrews & Goodrich; R. M. Cook, manager of Ross Midwest Fulton; H. H. McCall, manager of Atlanta office; R. W. Morsch, manager of Los Angeles Shop and office; R. W. Grott, manager of Seattle office; L. G. Janett, vice president, Chicago office; F. W. Partsch, vice president, Boston office; C. J. Schmidt, executive vice president; and S. W. Fletcher, president.

will use static devices exclusively and that it will have reliability equal to or better than that of typical heavy-duty production equipment. He also said the computer will be suitable for installation in the immediate vicinity of the process equipment it controls.

Nu-Matic Announces Move

Headquarters and manufacturing operations of Nu-Matic Grinders Inc., have moved from their former address in Cleveland to 875 E. 140th St., Cleveland 10, Ohio.

Nu-Matic manufactures inflated and expanding abrasive finishing wheels and has just gone into the manufacture of portable belt sanders, inflatable drum sanders, and floor-mounted sanding machinery.

Timken Guarantees Prices

The Timken Roller Bearing Co. has announced a guarantee of Timken bearing prices to its original equipment manufacturing customers for production purposes for the calendar year of 1960.

P. J. Reeves, vice president in charge of sales, said the company has launched a five-year modernization program, the object of which is to stabilize bearing costs.

Controls Co., Electrosnap Merge

A merger of Controls Co. of America and Electrosnap Corp. has been approved by stockholders of both companies. Under the terms of the merger, each five shares of Electrosnap common stock is to be converted into six shares of Controls common, resulting in the issuance of 110,400 shares of Controls stock.

Electrosnap is a Chicago-based manufacturer of switches, and Controls Co. is a leading manufacturer of automatic controls with headquarters in Schiller Park, Ill.

Illinois Tool Works Names Three Officers

Illinois Tool Works, Chicago, has announced three executive appointments and promotions. Silas S. Cathcart was elected vice president for corporate planning. He will also serve as administrative assistant to the executive vice president. James D. Norman was named general manager of the company's Fastex Division, Des Plaines, Ill., succeeding Cathcart. Harold Byron Smith, Jr., succeeds Norman as sales manager of the Fastex Division. He was formerly engaged in engineering and product development.

Bliss & Laughlin Announces Proposed Acquisition

Directors of Bliss & Laughlin, Inc., Harvey, Ill., and Sierra Drawn Steel Co., Los Angeles, Calif., have approved a plan contemplating the acquisition of Sierra Drawn by Bliss & Laughlin.

In making the announcement, Arthur Lehr, president of Bliss & Laughlin, said that the acquisition is subject to the approval of the stockholders of Sierra Drawn. Both companies are producers of cold-finished steel bars.

National-U. S. Radiator Acquired by Crane Co.

The Crane Co. has acquired the plant equipment and inventory of National-U. S. Radiator Corp. for a cash price of \$15 million. At the same time, Crane Co. directors approved a plan to acquire the Autronic Div. of the Swartwout Co., Cleveland, Ohio, subject to final approval of the Swartwout stockholders.

Earlier, chairman of the Crane board, Thomas M. Evans, had announced that Crane had obtained more than 10 per cent of Briggs Mfg. Co.'s stock, and is interested in acquisition of that company's assets.

National-U. S. Radiator manufactures

Let NAGEL-CHASE
Supply Your V-Belt Pulleys!



- Single Groove, FHP
- Strong, Welded, Pressed Steel Design
- Light Weight
- Wide Range of Standard Sizes
- 2.4" to 12" PD for "A" and "B" Section V-Belts
- 1/2" to 1" Bore

Original equipment manufacturers whose products incorporate V-Belt Pulleys can make substantial production savings by obtaining them from Nagel-Chase. Specialists in the production of fractional HP pulleys, Nagel-Chase has the tools and production facilities for a wide variety of standard sizes. With this elimination of tool costs and the release of production facilities for other components, manufacturers find the use of Nagel-Chase pulleys cuts production costs.

Write for complete details and specifications
The NAGEL-CHASE MFG. CO.
2817 No. Ashland Ave., Chicago, Ill.



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In Trim Hardware, Your Best Bet Is To Call For Grigoleit

- ALUMINUM TRIM
- DECORATIVE METALS
- CHROMED HARDWARE
- STOCK EMBOSSED PATTERNS
- MOLDED PLASTICS

... all from press or rolled section tools — anodized — chrome plated — painted — silk screened — lithographed. All in our own plant!

For distinctive decorative trim . . . bezels, control panels, escutcheons for ranges, refrigerators, freezers, washers, dryers and combinations. Add eye appeal — buy appeal to your product, choose Grigoleit!

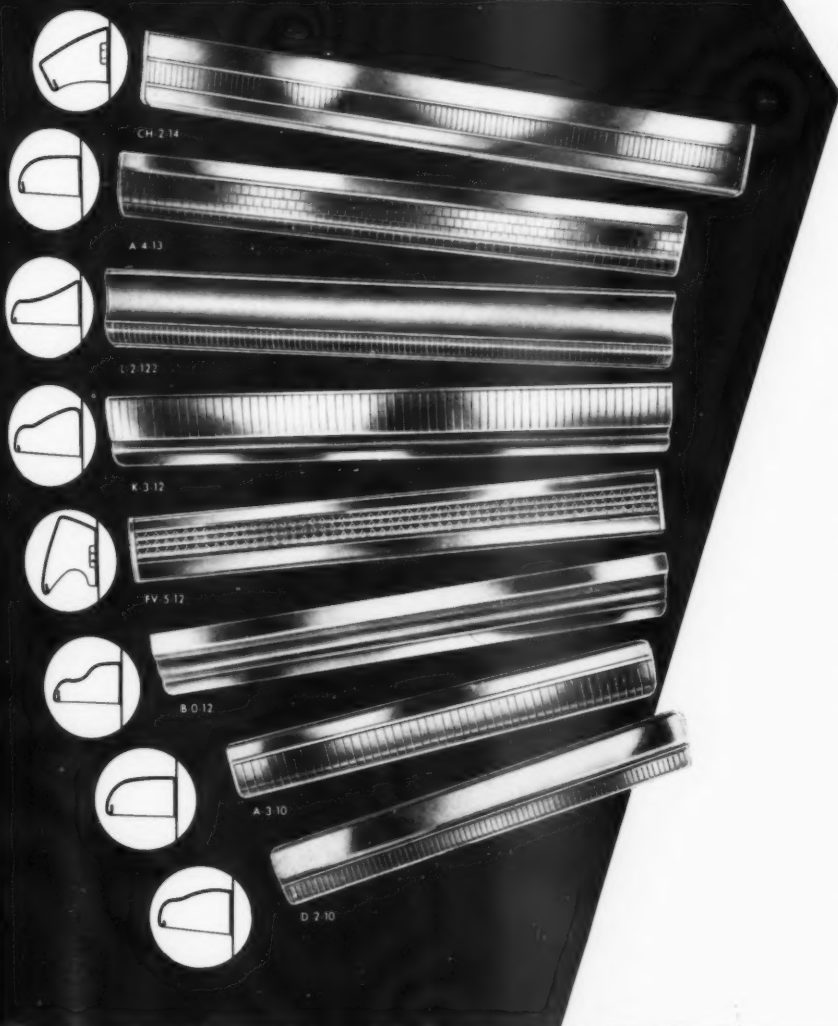
FOR ALL CUSTOM-MADE OR STOCK TOOLED APPLIANCE HARDWARE, CALL ON —



THE GRIGOLEIT COMPANY
Over 30 Years in Plastic
740 E. NORTH ST., DECATUR, ILL.

PERMA-GRIP® Handles

are available to you in...



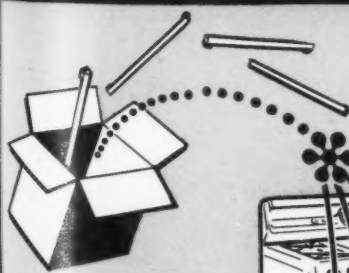
12 STANDARD MODELS

IN THE MILLS LINE YOU HAVE A SELECTION OF DISTINCTIVE DESIGNS AVAILABLE IMMEDIATELY AT STANDARD PRODUCTION PRICES...

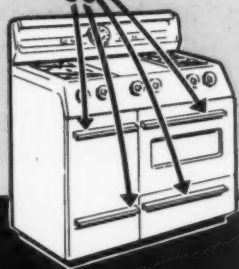
PERMA-GRIP® handles are produced by Mills Products, Incorporated, manufacturer of the now universally accepted PERMA-VIEW® oven door window.

You can now purchase your appliance handles built to Mills' quality standards. Twelve standard models are offered and six standard patterns are available on any model handle. All handles have plastic spacers which serve as a thermo-break. If you wish, consult with our engineering department regarding special custom requirements.

We have the skilled personnel, the specialized equipment, and we use the right materials to assure a reliable source for quality PERMA-GRIP handles. Let our specialized production lines serve as a part of your sub-assembly facilities. Phone or write us for complete details on PERMA-GRIP handles.

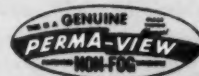


out of the carton—onto your range!



THE WINDOW YOU CAN SEE THROUGH ALWAYS

MILLS PRODUCTS INCORPORATED



1015 WEST MAPLE ROAD

WALLED LAKE, MICHIGAN

heating and air conditioning equipment, powdered metals, and special fabricated products. The company employs about 3,000 persons in nine manufacturing plants throughout the United States. Evans pointed out that the acquisition of the business of National-U. S. Radiator makes a full line of plumbing and heating products available both for Crane and National-U. S. wholesalers.

New Gibson Carbide Plant

Gibson Carbide, Inc., recently broke ground for a new plant in Luquillo, Puerto Rico, to manufacture electrical contacts and contact assemblies for use in circuit breakers, switches, contactors, and other electrically-actuated equipment. The new corporation, Gibson Carbide, Inc., is a subsidiary of Gibson Electric Co., Delmont, Pa.

The new plant in Puerto Rico will cover 11,500 square feet and will have 50 employees. Herbert C. Graves III will be general manager.

Despatch Names Representative

Despatch Oven Co., manufacturer of industrial ovens and furnaces, has appointed Schaffer Engineering Co., Detroit, Mich., a representative to serve industry in the Detroit area.

Beside distributing Despatch ovens and furnaces, Schaffer represents the following manufacturers: Century Instrument Co., manufacturers of thermometers and pressure gauges; Combustion Research Co., gas-fired immergent heating systems; and RKL Valve & Mfg. Co., valves.

ASA Names Three Officers

Three new officers have been appointed for sectional committee MH2, metal drums and pails, of the American Standards Association. O. X. Pitney, Rheem Mfg. Co., and R. S. Sawyer, United Steel Barrel Co., are co-chairman. Mrs. L. B. Miller of the Steel Shipping Container Institute was appointed secretary of the committee.

Aluminum Mill Products Sales Group Formed by Dow

An aluminum mill product sales group has been formed by The Dow Metal Products Co., Division of the Dow Chemical Co., Midland, Mich. The division was formed in July, 1959, and operates Dow's metalworking facilities at Madison, Ill., and Bay City, Mich.

Creation of the new group is the result of Dow's increased emphasis on aluminum and is part of the overall program of diversifying to include other metals in addition to magnesium, the

report states. The group will be headed by H. E. Swayze, who formerly was associated with Dow's magnesium mill products sales.

As a first step in its augmented aluminum program, Dow is devoting more of the capacity of its 13,200-ton extrusion press and smaller extrusion presses to aluminum.

Wyandotte Presents Award

The Chicago District of Wyandotte Chemicals Corp., Wyandotte, Mich., has received an award for "outstanding performance in 1959." The presentation was made at the company's three-day district sales managers' conference recently in White Sulphur Springs, W. Va.

Commercial Testing Lab Set Up by Schaevitz

Schaevitz Engineering, Pennsauken, N. J., has established a commercial laboratory for the testing and calibration of industrial instruments.

Called Schaevitz Testing Laboratories, the new company is the third Schaevitz company. A large portion of the company's new 50,000 sq. ft. plant has been turned over to the new operation. Provision has been made to incorporate a

complete acoustic testing facility as well as what the company believes will be the largest commercial centrifuge available to industry.

Curtiss-Wright, Hupp Corp. Announce Research Pact

Curtiss-Wright Corp. and Hupp Corp. have announced the signing of an agreement through which the corporations will work together in the exploration and development of solar energy and other heating devices for commercial and home use.

John O. Ekblom, chairman of Hupp, said "This mutual exploration will determine product possibilities, their markets, and their economic feasibility."

Hupp manufactures air conditioning, refrigeration, and heating equipment.

Pennsalt Builds Plant, Technical Center

Pennsalt Chemicals Corp. has announced plans for a new plant in Atlanta, Ga., and a technical center in King of Prussia Park, Pa.

The \$500,000 plant in Atlanta will be equipped for blending, packaging, and warehousing, and is scheduled to go on stream this spring. The firm now has

Refrigeration Equipment for Production Chilling

The special low temperature production chilling machine shown below, designed for stabilization of metal aircraft structures, is typical of the line of custom and standard refrigeration equipment available from Cincinnati Sub Zero Products, Cincinnati, Ohio.

The chamber, utilizing a convection fluid for a more rapid uniform chill, has a maximum low temperature of -150° F. and a thermal capacity of 14,000 Btu/hr at -120° F. With the pre-chilled

liquid in the chamber, 500 pounds of steel per hour can be chilled from ambient temperature to -110° F.

Overall dimensions of the machine are 140 inches long, 66 inches wide, and 38 inches high. The zinc-coated, liquid-tight chamber measures 60 inches long, 36 inches wide, and 26 inches deep. Construction is of welded steel with rounded corners for additional strength and safety. Refrigerant tubes completely surround the chamber.



chemical specialty plants in Pennsylvania, Ohio, Illinois, California, Texas, Georgia, and Ontario, Canada.

The \$6 million technical center will be located on a 50-acre site. Plans call for a campus-type arrangement featuring a central mall. The first building will be a two-story laboratory occupying approximately 21,000 sq. ft. This will be devoted to product development and technical service on Pennsalt's proprietary chemicals for the metal working industry and other fields.

Acme Stamping Changes Name

The corporate name of the Acme Stamping & Mfg. Co., Pittsburgh, Pa., has been changed to "Acme Stamping & Wire Forming Co." The corporate structure, management, and operating policy remain intact.

Stevens to Distribute Wyandotte Products

Wyandotte Chemicals Corp., J. B. Ford Div., announced the appointment of Frederic B. Stevens, Inc. as a distributor for Wyandotte metal cleaning and finishing products in the states of Michigan, Ohio, and Indiana.

Stevens will maintain a complete stock of Wyandotte metal cleaning and finishing products at its warehouse facilities in the three-state area it will serve.

Paint School Subjects Announced

Binks Mfg. Co. reports that the spring session of their spray painting school will cover all phases of spray finishing. Particular emphasis will be placed on airless and electrostatic spray painting.

The school is tuition free. John Adams, newly-appointed director of consumer research, will conduct all classes. A total of six sessions will be held during the first half of 1960. The first was held January 4-8, and additional classes will be held February 1-5, March 7-11, April 4-8, May 2-6, and June 6-10.

The school is open to all interested, although enrollment is limited to 25 students per session. Enrollment can be arranged by writing to B. J. Hedger, Binks Mfg. Co., 3114 Carroll Ave., Chicago 12, Ill.



John Adams, spray finishing school instructor at Binks Manufacturing Co., conducts a session of the school.

A. O. Smith Appoints Six

The Electric Motor Div. of A. O. Smith Corp. has announced the appointment of one district sales manager and five additional district sales engineers. New sales manager of the Southeast and Central District is James E. Jackson. Daniel C. Rogers is the newly-appointed sales engineer in the Division's Northeast District, headquartered in New York City. Richard J. Rashilla was named to the Southeastern and Central District as a sales engineer, handling accounts out of Tipp City. New sales engineer in the Northeast District is James A. Wilson, and William A. Joubert has been appointed sales engineer in the Western District, with offices in Newark, Calif.

Westinghouse Announces Marketing Department Changes

A series of changes within the marketing department of the Westinghouse Electric Corp.'s Portable Appliance Div. were announced recently. They are: R. C. Ellsworth, sales manager; J. E. Hugo, manager of the department that includes electric housewares; Frank Waters, manager of the department that includes vacuum cleaners, floor polishers, fans, heaters, and evaporative coolers; and F. P. Walter, manager of product distribution.

NICKELOID METALS IN A

Woman's World



Part of that happy, gleam in the eyes of a modern homemaker is because of the convenience, the ease, and the pleasant decorative warmth of her kitchen. Along with the soft woods and pleasant colors she revels in the easy-to-maintain gleam of clean bright appliances, housewares, working surfaces and decorative trim. The efficient chromium and the warm copper . . . seen so much about the modern kitchen . . . are most probably stamped or fabricated from one of the versatile galaxy of Nickeloid Metals. There's eye appeal and there's sales appeal in appliances and housewares which utilize Nickeloid Metals. Liked, too, by designers and production engineers. Complete information about Nickeloid Metals and the Nickeloid pre-finished metals method is contained in a special kit, which will be mailed you on request.

AMERICAN NICKELOID COMPANY

PERU 11, ILLINOIS

Plants: Peru, Ill. and Walnutport, Pa.



NEW

PRODUCT NEWS FROM *Pfizer*

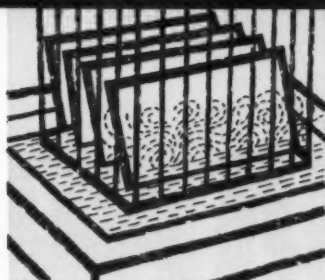
NOW!



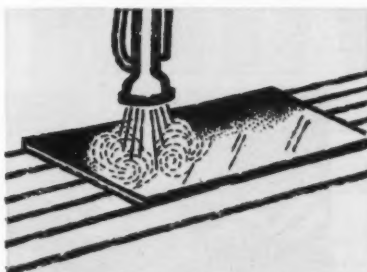
Manufacturing Chemist

Chas. Pfizer & Co., Inc., 630 Flushing Ave., Brooklyn 6, N. Y. Chemical Sales Division, Branch Offices: Clifton, N. J.; Chicago, Ill.; San Francisco, Calif.; Ventnor, N. J.; Atlanta, Ga.

1
Pickle in
citric bath



2
Apply cover
coat frit directly.



3
Fire in existing
equipment.



PRACTICAL DIRECT-ON PORCELAIN ENAMELING WITH PFIZER CITRIC ACID

It's simple. The secret of really practical *direct-on* porcelain enameling is using a *citric acid* solution as your pickling bath. And *direct-on* porcelain enameling means you can double your oven capacity, cut your handling and obtain a better, more flexible porcelain coating. Bond and finish characteristics are excellent.

In this new Ray-Davis* process, only cover coat enamel is required. The ground coat step is completely eliminated. Although adequate process controls are needed, no special handling technique or major installation of equipment is required.

Mail in the coupon below for complete technical information on this important new porcelain enameling development.

Important advantages of the Ray-Davis Direct-On process

- No special handling of pickled steel is required.
- No major installation of special equipment necessary.
- Uses non-premium type steels.
- Easy to handle—citric is a dry, non-toxic, water soluble acid.
- Only one application of frit.
- Doubles oven capacity.

*Developed by W. G. Ray, Chas. Pfizer & Co. and Shipp C. Davis, Daco Corp.

Chemist Over 100 Years



Science for the
world's well-being

Calif.; Vero; Atlanta, Ga.; Dallas, Tex.; Montreal, Can.

Mail this coupon to:

CHAS. PFIZER & CO., INC. CHEMICAL SALES DIVISION
630 Flushing Avenue, Brooklyn 6, N. Y.

Please send me: ☐ Technical Information
☐ Sample of steel porcelainized by Ray-Davis process

Name _____

Company _____

Address _____

City _____ State _____

GUARD YOUR FAMILY

FIGHT CANCER WITH A CHECKUP AND A CHECK

Send your gift to "CANCER" in care of your local post office

AMERICAN CANCER SOCIETY



Housewares exhibit

→ from Page 33

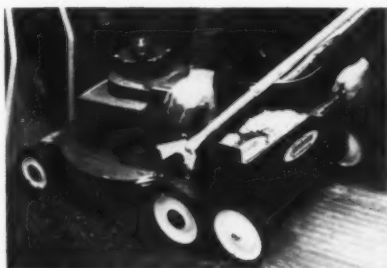
are "engineered to hit the retail price market where the off-branded people are starting to hit. There will be no loss to distributors or dealers."

Buyer-manufacturer survey

A report released by the National Housewares Manufacturers Association at the time of the exhibit indicated that white will be the leading "color" in housewares in 1960. The prediction was made by housewares buyers and manufacturers replying to the eighth nationwide business survey conducted by NEMA.

Eighty-seven per cent of buyers and 65 per cent of the manufacturers named

New at the exhibit was Sunbeam's Piggy Back Pow-R-Spreader, which spreads fertilizer while grass is being cut with a power mower.



Two models of the Commercial Blendor manufactured by Waring Products Corp. Discussing the products are (left) Donald E. Sharkey of the company's sales department and Lenox S. Reid, Waring Commercial Division sales manager.



Joseph Lovett, New York district manager of Fasco Industries, Inc., explains Wheel-A-Breeze fan to Walter Haynes (left) and Ray Ross of Abercrombie & Fitch. The Wheel-A-Breeze allows fan height adjustment from 20 to 47 inches above the floor. The fan can be swiveled in a 360° arc.



EXCLUSIVE MPM PHOTOS

white, yellow, pink, turquoise and red as the five housewares colors they expect to sell best in 1960. Seventy per cent of those who predicted combinations of two colors as the probable best sellers also specified white as one of the colors.

Business surveys are conducted twice annually among housewares manufacturers and buyers before the industry's January and July trade shows. Questionnaires were returned by 41 per cent of the 864 housewares manufacturers currently served and by 19 per cent of 7,880 buying firms in both wholesale and retail merchandising categories.

Seventy-four per cent of the manufac-

turers who answered the questionnaire said 1959 unit volume was more than the 1958 volume. Nine per cent said volume was less, and 17 per cent replied that the unit volume was about the same as 1958.

Independent housewares show

The Independent Housewares Exhibit, running concurrently with the NHMA show, was held in Chicago's Morrison Hotel. The independent show was launched in 1953 to handle the overflow from Navy Pier, and this year there were 750 exhibits spread over 11 floors. As a rule, smaller, newer companies exhibit at the Morrison.

Salton Mfg. Co. President Lewis L. Salton explains the company's new Royal Gold Hot-table. The unit has a radiant-glass heated surface and a gold-anodized aluminum frame.



Egyptians to jets

→ from Page 37

presented no problem. Larger and larger pieces were enameled and, in 1830, in Bohemia, the first cast iron cooking utensils were porcelain enameled—opening the door to a new industry.

As its functional advantages were realized, the use of porcelain enamel spread from cooking utensils—its first commercial use—to bathtubs, sinks, and ranges. The hard, durable, easily-cleaned surface made it an ideal material for bathtubs and sinks. And because it is also heat proof, porcelain enamel soon became one of the leading materials in the manufacture of ranges.

In its early applications there were just a few formulas for porcelain enamel; the familiar old blue and white speckled found on grandmother's dishpan was expected to serve all products. But today's porcelain enamel is a custom-designed material comprising thousands of individual formulas—a different formula for each need. For example, the porcelain enamel used in a refrigerator liner is a great deal different from that used in a water heater.

While most people are familiar with the use of porcelain enamel in bathrooms, kitchens, and on laundry equipment, few people are aware of the important job it performs in many industries. In the plastics and rubber industries the processing of thick, syrupy materials that are also highly corrosive is a continual problem. To protect the tanks, pipes and reactors from corrosion, and from clogging by a rapid build-up of a thick film, porcelain enamel with its hard, protective, glass-smooth surface is used throughout the process.

Because neither gas nor liquid can penetrate the non-absorptive surface of porcelain enamel, food processing industries use it to insure absolute purity. In the pharmaceutical industry porcelain enamel is used to protect products from contact with the metal of pipes, vats, and mixers where the slightest presence of metal, even trace quantities, will cause spoilage.

Ceramic coatings . . .

their use in aircraft

The ability of ceramic coatings—porcelain enamels fortified with special heat-resistant materials—to withstand both intense heat and sudden changes in temperature is the reason it is playing a growing role in the development of the turbo-prop, turbo-jet, and ram-jet aircraft. Typical uses of ceramic coatings include combustion chambers, turbine blades, and afterburners.

Since World War II, probably the most dramatic forward step in architecture has been the advent of curtain wall type construction. In this newer mode of architecture the exterior walls of the building are non-load bearing panels attached to the outside of a concrete or steel frame. This outer skin serves as insulation and protection from weather, and as a curtain to control light. A durable finish that will not stain, fade, or peel—an unlimited color range—many stippled and mottled two-tone effects—and a variety of finishes from non-reflective to high sheen—all permit the architect complete freedom of expression in design when using porcelain enamel. The use of this material in the curtain wall field has been so successful that it has been instrumental in increasing the volume of architectural porcelain enamel a whopping 1600 per cent since 1948.

While porcelain enamel is relatively new as a curtain wall application, it has been used since the early 20's in veneer-type construction and in remodeling. In veneer-type construction, porcelain enamel panels are attached directly to the outer walls providing a colorful, lifetime protection that requires a minimum of care and cleaning. Schools, motels, shopping centers, and small plant and office buildings are just a few types of new construction where porcelain enamel has been extensively used. In addition, hundreds of old buildings have been restored to life and their rental value increased with veneer-type architectural porcelain enamel.

Porcelain enamel for the home of the future

In the home of the future, porcelain enamel is expected to take its place alongside wood, steel, glass, and others as a conventional building material. Porcelain enamel roofs, window wall units, and interior mural walls are just a few of the component parts now in use in commercial buildings which can be easily adapted to home building.

Renewed confidence in the practicality of porcelain enamel in the home building industry has caused one of the leading companies in the industry to begin plans for designing an all-porcelain enamel house. It is expected that the new porcelain enamel house will ultimately be a mass-production type which could substantially reduce the growing costs of home building.

Porcelain enamel has also invaded schools and classrooms in the form of chalkboards. These new chalkboards—sheets of steel that have been covered with porcelain enamel, usually in an eye-

ease green—lend themselves to many applications unknown to the old slate or composition type. Mounted on rollers, they can be used as sliding doors and room partitions. They can also be used for graphic presentations by attaching cutouts to the chalkboard with magnets. The new chalkboards have been so warmly received by educators that the Government purchased 160,000 square feet for installation at the new U.S. Air Force Academy at Colorado Springs, Colorado.

Use of porcelain enamel continually expanding

From art to industry, intensive research is continually expanding the uses of porcelain enamel. Thinner coatings to withstand greater temperature changes—lower firing temperatures that now permit the porcelain enameling of aluminum—new formulas to cope with high temperature problems in the growing missile industry—uses in new products such as electroluminescent lighting, where electricity is changed directly into light—these are just a few of the recent developments in porcelain enamel to come from the research laboratories.

While today's artist uses basically the same process as his ancient Egyptian counterpart—glass bonded to metal by heat—improved techniques, methods, and materials have greatly widened his scope of expression. Vases, ashtrays, plaques, dishes, murals, sculpture, and even paintings on steel by today's porcelain enamel artist are taking their places next to the ancient masterpieces of the world, pointing out to generations to come the beauty and versatility of one of the truly unique materials in our modern life, porcelain enamel.



INDUSTRY PERSONALS

The appointment of **John P. DeHetre** as general manager of sales of the **Youngstown Sheet and Tube Co.** was recently announced. DeHetre joined the company in 1938 as an assistant field engineer in Los Angeles. He has been assistant sales manager since 1954.

Earl C. Silver is the director of purchases of the **Reynolds Metals Co.** He has been assistant general purchasing agent at Reynolds since 1947. Reynolds also promoted **Ralph F. Thompson, Jr.** to manager of the appliance and equipment market.

Robert E. Wolff, former sales manager of the **Tool and Instrument Division of Illinois Tool Works**, has been named general sales manager of **Van Straaten Chemical Co.** He will be in charge of the sales department, handling industrial cutting, grinding and cleaning compounds.

Harold Taylor Ames, industrialist, has been elected director of **Controls Co. of America**, Louis Putze, president, has announced.

Ames was chairman of the board of directors of **Electrosnap Corp.**, Chicago, before its merger into Controls Co. December 31. He has been president of **Chicago Electric Mfg. Co.**, **National Stamping & Electric Co.**, and **La Porte Corp.** Ames is also director of **American Airlines, Inc.**, **Upper Avenue National Bank of Chicago**, the **King-Seeley Corp.**, and **Mid-America National Bank of Chicago**.

Walter A. Lean is retiring as vice president and technical director of the **Wilcolator Co.** He joined Wilcolator in 1927 as a sales engineer when the company had 50 employees. Today it employs 600. In announcing Lean's retirement, President **Robert R. Forrester, Jr.**, said, "Mr. Lean has been instrumental in keeping Wilcolator predominant as one of the leading companies in the industry."



O'BRIEN



HIGDON



PIERCE



LENZI

The board of directors of **Maytag Co.** has been enlarged from seven to nine members with the naming of two new directors. The new directors are **E. G. Higdon**, vice president and comptroller, and **H. F. O'Brien**, president of the **A. P. Smith Manufacturing Co.**, retaining an "outside" majority in the board.

James R. Oberly has been promoted to the dual position of vice president, international operations, **Admiral Corp.**, and chairman of the board of **Admiral International Corp.** He was formerly vice president, appliances, and president of the international corporation.

B. H. Melton, formerly national sales manager of Admiral's appliance division, succeeds Oberly as vice president, appliance division.

Richard C. Walker has been appointed general sales manager of the appliance division of **Manitowoc Equipment Works**.

W. E. Otis has been named contract and marketing administrator by **Grayson Controls Div.**, **Robertshaw-Fulton Controls Co.** He joined the company in 1951 and has been contract administrator since 1954.

Henry P. Rankin, Jr., is the new assistant general manager of sales for **Republic Steel Corp.** Rankin joined Republic in 1933 as a laborer at the company's Cleveland District steel plant and later, after participating in the company's sales training program, he became a salesman in the Cleveland District sales offices. He has been manager of sales for the Bar Division since October, 1954.

Lennox Industries Inc. announces the appointments of **Robert A. Pierce** and **F. Gordon Lenzi** as general manager and sales manager, respectively, of the Lennox Syracuse, N. Y. division.

R. G. Birkin has been appointed sales manager of the **Heavy Machinery Div.**, **The Cleveland Crane & Engineering Co.** Birkin has been with the company for 33 years and in recent years he has been Eastern district sales manager of the Heavy Machine Div.

Parker Rust Proof Co. has announced the appointment of three technical representatives. **Ken James** is responsible for the northwestern Ohio area, **Wallace Howells** is serving the Minnesota area, and **Joseph VanCooley** is responsible for sales and service of Parker's chemical coating products used by the metal-treating industry in central Illinois.

The election of **Wesley A. Songer** as president and chief administrative officer of **Crane Co.** has been announced by T. M. Evans, chairman and chief executive officer. The new president, before joining Crane, was executive vice president of **American Safety Razor Corp.**, and earlier had served on the president's staff of the **General Electric Co.**

Detroit Controls Division of American-Standard has elevated three executives to vice president. The three include **John R. Warnock**, general manager of marketing; **Richard L. Campbell**, director of engineering; and **George F. Butterfield**, general manager of manufacturing. They will continue to supervise these activities.

More Personals →

AMES

LEAN

OTIS

RANKIN

SONGER

WARNOCK





*need a
lion tamed?
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specialist
and*

for Heating
Elements with
Built in Quality
call
the Tuttles
in Tecumseh



Element for Supplemental
Heat. 1.3 kw. @ 115 V. or
2 kw. @ 230 V.

FREE Ask for 8 page descriptive brochure



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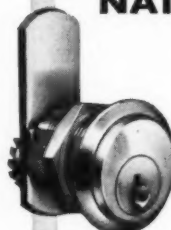
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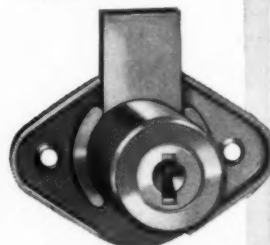
LOCKS

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NATIONAL LOCK

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electrical equipment
custom cabinets
furniture*



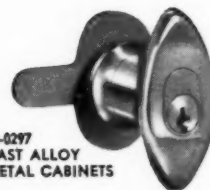
68-106
PIN TUMBLER
GENERAL UTILITY



68-6705 HALF MORTISE
PLATE TUMBLER
DRAWER AND DOOR



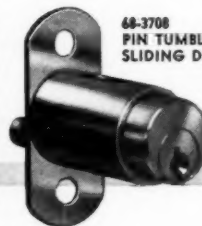
68-0231
PLATE TUMBLER
CLIP MOUNTED



68-0297
CAST ALLOY
METAL CABINETS



68-3709
STRIKE



68-3708
PIN TUMBLER
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NATIONAL LOCK COMPANY
ROCKFORD, ILLINOIS
Industrial Hardware Division

Mervin L. Lewis, who joined the **Maytag Company's** market research department as a sales analyst in June, 1956, has been promoted to senior consumer research analyst at the appliance firm. He is currently serving as secretary of the American Marketing Association.

J. P. Moffitt has been named manager of the room air conditioner department of **Westinghouse Electric Corp.** He had been merchandise manager of the department since 1957. He joined Westinghouse in 1954 as room air conditioner regional manager for the Eastern and Mid-Atlantic region.

Edward P. Mitchell has been added as a sales engineer to the Eastern Region staff of the **Welding Products Division, A. O. Smith Corp.** In his new position Mitchell is responsible for welding electrode and machine sales in New York City and neighboring New Jersey counties.

Two sales executives of the **Olin Mathieson Chemical Corp.** have been promoted. **Joseph F. Krepley** has been appointed extrusion product manager, and **Richard E. Clay** has been named transportation sales manager.

The **Carborundum Co.** has announced the appointment of **John F. Claydon** as vice president. He had previously served as general manager of the Coated Abrasives Division.

Two regional service managers, **James P. Middleton** and **Pete J. Cummings**, have been appointed by the **Fedders Corp.** The new managers will be responsible for all activities related to the customer relations and service functions in their respective regions for all Fedders air conditioning products.

Pemco Corp., Baltimore, has promoted **John A. Zingor** to field manager, Enamel Division.

With Pemco for 25 years, Zingor has been manager of the company's oxide department, service engineer for porcelain enamel frits, and both sales engineer and sales manager of the Eastern division. In the future, he will supervise all field personnel for porcelain enamel in the U. S. for Pemco.

Kaiser Steel Corp. has announced the election of **C. Lee Emerson** to the position of vice president in charge of sales. Emerson joined the Kaiser organization in 1942 as materials engineer at the Richmond, California shipyards. In 1945 he transferred to the sales department.

Walter H. Bandy was elected to the board of directors of **American Furnace Co.** at the annual stockholders meeting recently in St. Louis.

Larry Dwyer has been appointed to the post of vice president, sales, of the **Clad-Rex Division of Simoniz Co.** The announcement was made by Scott Campbell, vice president of Simoniz and general manager of Clad-Rex. Dwyer was promoted from sales manager.

Clad-Rex is a producer of vinyl-metal laminates and pre-finished metals for the metal fabricating industry.

The appointment of **Aldon M. Asherman** as manager of market research of the **Chemical and Metallurgical Div. of Sylvania Electric Products, Inc.**, has been announced by Robert Beatty, general marketing manager of the division.

Several changes in the executive organization of **Armco Steel Corp.** have been announced by R. L. Gray, chairman and L. T. Johnson, president. **Wallace B. Quail**, who has been vice president, sales, of the company's Armco Division, has been elected vice president in charge of distribution for the cor-



"JUST BETWEEN US GIRLS..."

there is a difference in appliances enameled with APEC Frit... stoves and washers in APEC Porcelain Enamel have an unusual sparkle and brilliance because APEC Alkali or Acid Resistant cover coats are more opaque... APEC whites are whiter, and APEC pastels are lovelier. Of course you can see the difference, my dear... and so can the cost conscious manufacturer who makes important savings through APEC quality and lower cost per pound in APEC Frits."



american porcelain enamel company

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poration. **Murray B. Wilson** succeeds Quail as sales vice president of the Armco Division.

William C. Higdon has been named vice president in charge of manufacturing. **Clyde G. Davies** has been elected vice president and general manager of that division, and **Robert F. Kuhnlein** becomes vice president of the Sheffield Division.

Mortimer Hill Hawkins has been appointed chief engineer by the **Erie Enameling Co.** He will be in charge of research, product development and engineering. **Anthony Konieczko, Jr.**, has been appointed assistant to the chief engineer.

Robert S. Raker has been promoted to assistant to the manager of the eastern area sales office of **Armco Steel Corp.** Raker succeeds **George S. Leighton**, who is retiring after 11 years in the post and 43 years of service with Armco.

Appointment of **Jan M. Garvin** as director of marketing for **USI Robodyne** was announced recently by **Edwin F. Shelley**, president. This division of **U.S. Industries, Inc.**, is a manufacturing corporation in New York engaged in the designing and manufacture of industrial and postal automation equipment.

D. C. Trueman, chief draftsman in charge of engineering for the **Steel-weld Division** of the **R. C. Mahon Co.** has been named assistant general manager of the unit. Trueman joined Mahon in 1946.

John W. Richards has been appointed sales manager and vice president of **National Stove Co.**, **National Kitchens** and **National Vanity**. He will be responsible for the entire distribution of the three companies' products.

The **Carpenter Steel Co.** has appointed **John W. Lynch** sales manager of special products. He will work with the product sales managers and the field sales force in developing new business for the company's vacuum melting facilities which include both consumable electrode and the induction vacuum furnaces.

Pittsburgh Plate Glass Co. has announced the appointment of new divisional vice presidents in the merchandising division and in the paint division. **Howard J. Mather** has been named vice president of industrial sales for the paint division and **Paul A. Ketchum** has been appointed vice president in charge of glass sales for the merchandising division.

John Verson, senior vice president of the **Verson Allsteel Press Co.**, Chicago, passed away Friday, January 8, at Miami Beach, Fla. He had suffered a series of heart attacks in recent weeks. Mr. Verson founded the metalworking equipment firm along with his brother, **David C. Verson** and, in addition to his post with the Chicago firm, was president of **Verson Mfg. Co.**, Dallas, Texas.

Three sales appointments have been announced by **White-Rodgers Co.** **F. J. Maney** has been named New York district manager, where his responsibilities will include supervision of sales covering a large portion of New York, New Jersey and Connecticut. **Roger P. Coombs**, formerly located in Chattanooga, Tenn., is now headquartered in Indianapolis, Ind., and **Harold E. Ter-rambel** was appointed sales manager in the Des Moines, Ia., district.

Fred G. Brear and **William M. Vaughn** have been appointed manager of customer service and manager of administration, general sales, respectively, at **Kaiser Steel Corp.**

Brear will assume responsibility for sales division customer service standards, and Vaughn will be in charge of coordinating administrative functions of the company's sales offices and will supervise the handling of pricing and government contracts.

Lewis C. Laderer has been elected president of **Wells Aluminum Corp.** The announcement was made by **Lincoln A. Sollitt**, board chairman. Laderer was formerly executive vice president of Wells.

Peter Arnold, formerly development engineer for automatic equipment with **Hanson-Van Winkle-Munning Co.**, has been appointed Eastern sales manager for equipment of the **Meaker Co.**, manufacturers of automatic systems for batch or continuous metal processing and finishing. Arnold has patented several inventions for automatic load and unload machines and continuous conveyor-type equipment for electroplating, metal finishing and processing.

George P. Burns has been elected vice president and sales manager, machine tools, for the **Van Norman Machine Co.**, a division of **Van Norman Industries**. He joined Van Norman 20 years ago as a turret lathe operator. In succeeding years he worked as a plant foreman, general foreman and assistant superintendent.

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LADERER



ARNOLD
BURNS



NEW

SUPPLIES & EQUIPMENT

Zinc Plating Brighteners

Two brightening agents for zinc plating have been developed. Named Isobrite #354 and #355, both are supplied in liquid form in either five gallon lined pails, or an Auto-Flo-Pak container. They are said to be extremely stable, and to provide effective brightening even after weekend shutdowns. Liquid form eliminates mixing and simplifies control.

Isobrite #354 produces a white, bright plate directly from the barrel without bright dipping, and #355 produces a bright zinc deposit with a slight yellow cast, from barrels or rack plating tanks.

For more information, write to Dept. MPM, Allied Research Products, Inc., 4004 E. Monument St., Baltimore 5, Md.

Portable Indicating Pyrometer

A new version of a portable indicating pyrometer is primarily intended to measure temperatures between minus 40° F. and 200° F. It does this by means of two scales or arcs in order to provide 1° F. per scale division and readability to at least the nearest 1/10° F.

Called the Alnor Type 2300-B pyrometer,



it is reportedly the only pyrometer primarily aimed at indicating temperatures which are not far from normal room temperatures.

For further information, contact Dept. MPM, Illinois Testing Laboratories, Inc., 420 N. LaSalle St., Chicago 10, Ill.

Low-Force Rotary Switch

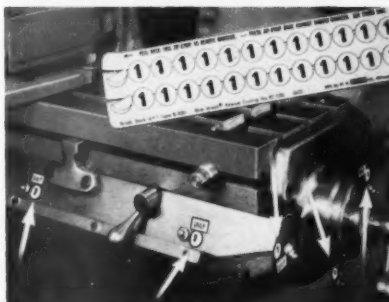
A low-force rotary switch, suitable for installations requiring precise, sensitive snap-action operation such as in counters or coin-operated devices, has been announced. The Model "J" switch is listed by Underwriters' Laboratories for five amperes, 120/240 volts ac. The brass actuating shaft is drilled and slotted to accept the actuator wire.

Further information is available from Dept. MPM, Acro Div., Robertshaw-Fulton Controls Co., P. O. Box 449, Columbus 16, Ohio.

All-Vinyl Color-Number Markers for Machinery

A method to insure regular and correct lubrication of machinery and equipment has been announced. The system utilizes self-sticking labels to identify lubrication points, tell the types of lubricant to use, and the frequency of lubrication. In use, the system is said to save labor and supervision time and, by assuring proper lubrication, to prevent equipment failure, costly repair and replacement, and production line downtime.

The labels are made from self-sticking vinyl



material, and are said to be highly resistant to oil, grease, and vibration. Numerals 0 through 9 are centered in a 3/8-inch diameter die-cut circle, and give lubrication engineers 50 codes to identify different greases, oils, and fluids used in their plant.

For further information, contact W. H. Brady Co., Dept. 1212, 727 W. Glendale Ave., Milwaukee 9, Wis.

Pressure-Sensitive Signs and Markings

A complete line of Dri-Mark films is now available. The films are custom-processed pressure-sensitive-applied signs for use as durable truck signs, window signs, nameplates, and product markings. In addition to Dri-Mark decals, the line includes these new products: Dri-Mark Vinyl, Dri-Mark Mirro-Cal (a chrome-bright mirrored film), Dri-Mark Clear Mylar*, Dri-Mark Mirro-Cal VML (a mirrored vinyl Mylar* laminate), and Dri-Mark Outdoor Paper. All films are protected by Colorgard 70, said to be an exclusive laboratory-developed clear top coat.

For further information, write Dept. MPM, The Meyercord Co., 5323 W. Lake St., Chicago 44, Ill.

* - Mylar is a Du Pont polyester film.



Electronic Thickness Gauge and Hardness Comparator

Coatings of any type and thickness can now be measured quickly and accurately with a new electric micro-gauge and comparator called the Elcotector, now available for the first time in the U. S. In addition to measuring metallic and non-metallic coatings on any dissimilar bases, the unit will also compare the hardness and grades of metals and other materials.

The unit operates on the eddy-current prin-



ciple by making use of the fact that the electrical characteristics of a coil are influenced in proportion to the conductivity of the materials being measured. Housed in an aluminum desk-type cabinet 12 inches by 8 inches by 8 inches, the instrument may be operated at 100/115, 220/230, or 240/250 volts ac, 50/60 cycles.

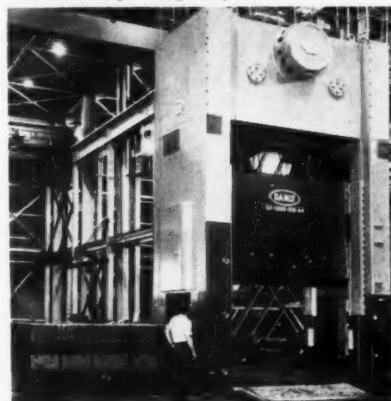
There is also a small size thickness gauge, by the same manufacturer, called the Elcometer, which measures coating thickness by the magnetic principle.

Information on either instrument is available by contacting Special Projects Editor, Metal Products Manufacturing, York St. at Park Ave., Elmhurst, Ill.

Press Offers Six-Minute Die Change

A quick die change press permits die changing with just five to six minutes downtime. This feature permits more advantageous scheduling of production runs to hold in-process inventories down, and parts can be produced as they are needed. The press, of 1,000 ton capacity, is a single-action, two-point press with a 120 inch by 44 inch bed area, and is reportedly equipped with every modern accessory for safety, speed, and convenience. Included in the features of the press are: self-propelled bolsters, electrically-controlled automatic die clamps, automatic slide positioning, hydraulic overload device, tonnage indicator, and locking cushions with pulldown.

For further information, contact Dept. MPM, Danly Machine Specialties, Inc., 2100 S. Laramie Ave., Chicago 50, Ill.





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PORCELAIN ENAMEL FRITS

... won't scratch or mar even under constant exposure to cutting desert sands. You're sure of a truly lasting finish when you use Hommel frits. Hommel research means added strength . . . real protection against acids, alkalis, scratches, thermal shock, abrasion. Designed to endure.

Hommel research also means lower production costs in your plant. The most exacting quality-control checks in the industry are your guarantee of always uniform performance . . . no costly tie-ups. And with Hommel, you have a ready source of supply, no matter how large your needs.

There is a Hommel frit designed to fill your exact porcelain enameling needs . . . at either conventional firing temperatures or at greatly reduced temperatures, with XLT®. The Hommel representative near you will be glad to discuss your individual needs.

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Dept. MPM-260

INDUSTRY MEETINGS

HEATING-AIR CONDITIONING

Second Southwest Heating and Air-Conditioning Exposition, Memorial Auditorium, Dallas, Texas, February 1-4, 1960.

ELECTRIC HOUSE HEATING

First National Electric House Heating Exposition, Sponsored by the Electric House Heating Equipment Section of the National Electrical Manufacturers' Association, Hotel Sherman, Chicago, March 21-23, 1960.

GAS APPLIANCES

Gas Appliance Manufacturers Association's Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va., March 30-April 1, 1960.

BUILDING RESEARCH

Building Research Institute's Spring Conferences, Statler-Hilton Hotel, New York, N. Y., April 5-7, 1960.

AUTOMATIC TECHNIQUES

Third Annual Conference on Automatic Techniques, Cleveland-Sheraton Hotel, Cleveland, Ohio, April 18-19, 1960.

TOOL ENGINEERS

American Society of Tool Engineers Tool Show and Annual Convention (Tool Show, Artillery Armory; Technical Sessions, Sheraton-Cadillac Hotel and Artillery Armory) Detroit, Mich., April 21-28, 1960.

WELDING

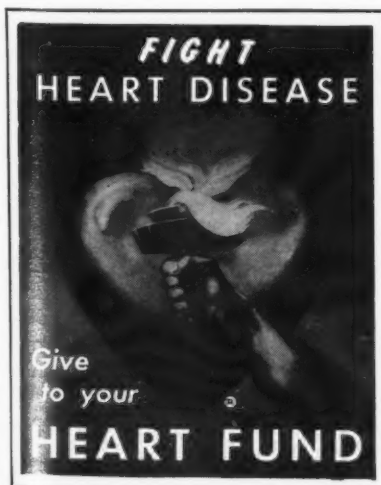
The American Welding Society's 41st Annual Convention and Welding Exposition, Los Angeles, Calif., April 25-29, 1960. (Technical Meetings, Biltmore Hotel, April 25-29; Welding Show, Great Western Exhibit Center, April 26-28).

AIR CONDITIONING

The Air Conditioning Industries Association's Western Air Conditioning, Heating, Ventilating, and Refrigeration Exhibit and Conference, Shrine Exposition Hall, Los Angeles, Calif., April 27-30, 1960.

ARCHITECTURAL METAL

The 22nd Annual Convention of the National Association of Architectural Metal Manufacturers, Boca Raton Hotel and Club, Boca Raton, Fla., May 1-7, 1960.



GENERAL INDUSTRIES

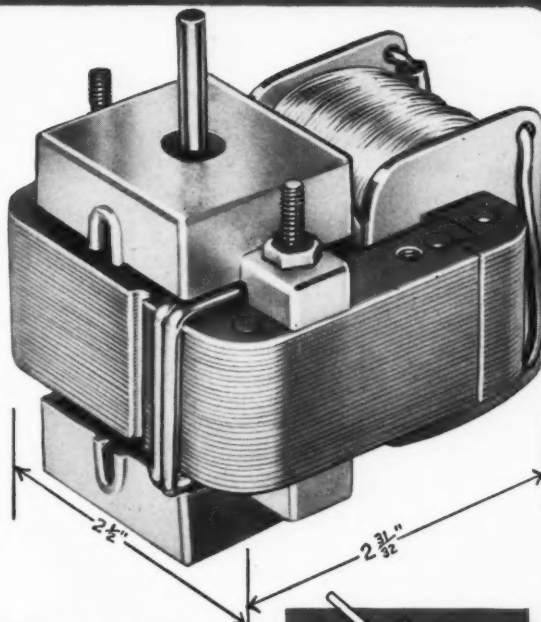
Smooth Power

AC MOTORS

1/1800 H. P. TO 1/35 H. P.

2-POLE SHADED POLE MOTOR

Model H
1/550 H.P.
to
1/50 H.P.

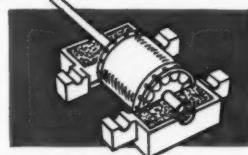


Designed and Constructed
with Features That Insure

EXTRA YEARS OF SERVICE

When exceptionally long service is a must, you can rely on GI's new Model H, 2-pole, shaded-pole motor. The Model H is constructed with many outstanding features that assure thousands of extra hours of service under the most adverse operating conditions. Available in nine models that cover a wide range of applications.

DIE-CAST BEARING BRACKET ... This new "H" Motor design includes a rugged die-cast bearing bracket that insures permanent precision alignment and adds to the over-all durability.

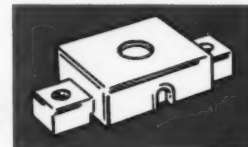


OIL CAPACITY MANY TIMES GREATER THAN CONVENTIONAL MOTORS

Oversized oil bearing reservoirs hold considerably more oil and wicking assuring more efficient lubrication over a much longer period of time.

Revolutionary Method of Packing the Oil Wicking

A unique new method of packing the oil wicking assures equal oil distribution at all times resulting in quieter operation and longer, trouble free life.



Write today for catalog sheet and quantity-price quotations.



THE GENERAL INDUSTRIES CO.

DEPT. GF • ELYRIA, OHIO

NEW

INDUSTRIAL LITERATURE

New Packaging Process Shown In Free Brochure

An illustrated brochure that describes an electronic packaging process is offered by this manufacturer. Said to save time and money, the process is applicable to any type of manufactured metal product requiring fasteners in packaging, including appliances, business machines, vending machines, and metal furniture.

The process will sort assembly materials in different sizes and assortments and package items in either translucent or kraft opaque bags up to 4½" by 4½" in size. It will also print up to three lines of copy on the side of the package. To obtain a free copy of the brochure, write to Dept. MPM, Mid-Continent Screw Products Co., 5844 N. Broadway, Chicago 40, Ill.

Heating Elements and Resistors

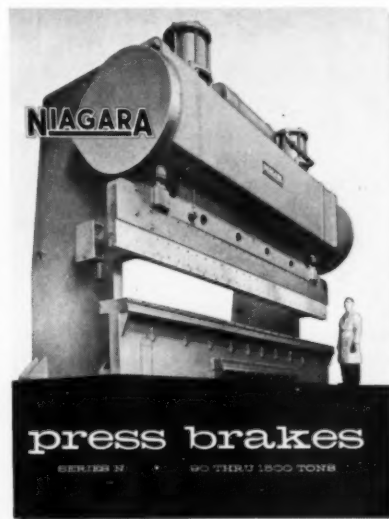
An eight-page facilities brochure describes a full line of heating elements and resistors including supplemental heat, flexible band heaters, strip heaters, and related heating equipment. One of the features of the brochure is the description of Adaptatherm, which the manufacturer claims is the only answer to many heating problems. Using a patented process, a specially insulated resistance wire is formed to give the desired heat distribution pattern and then "cast-in" a heat conducting metal such as aluminum. The manufacturer claims this arrangement provides immediate heat transfer, eliminates hot spots, allows a wide range of surface watt densities, and protects the unit from water damage. For a copy of the brochure, write Dept. MPM, H. W. Tuttle & Co., Tecumseh, Mich.

Spring Engineering Data

Complete engineering data on over 750 different springs is presented in a 20-page catalog. Springs covered are both compression and extension-type in stainless steel and music wire. All springs listed are in stock and available for immediate delivery. To obtain the catalog, write Dept. MPM, Lee Spring Co., Division of Leetronics, Inc., 30 Main St., Brooklyn, N. Y.

Press Brake Bulletin

A modernized line of press brakes is presented in a 28-page bulletin. Information given on the 90 through 1500-ton press brakes includes a description and illustrations of design features, special work area provisions, typical forming and bending dies, tables for computing bending, punching and blanking tonnages, die space and filler-block dimensions, and comprehensive specifications. For a copy of Bulletin 89E, write Dept. MPM, Niagara Machine & Tool Works, Buffalo 11, N. Y.



"Bronzeless Gold" Coatings

Advantages and applications of new "Bronzeless Gold" coatings are presented in a recently published booklet. According to the manufacturer, the new finish is non-tarnishing and made of non-critical materials. The Bronzeless Golds are available in standard and matched metallic shades, and are supplied ready-mixed—only thinner has to be added. The manufacturer says the coatings adapt to high-volume production methods in the manufacture of home appliances, lighting fixtures, radio and TV sets, vending machines and many other products where fine finishes are necessary. For a copy of the booklet write Dept. MPM, Bee Chemical Co., 12933 Stony Island Ave., Chicago 33, Ill.

Metal Processing Equipment

A 15-page booklet covering the range of machines, materials and manpower offered for every type of metal processing requirement has recently been announced. The illustrated booklet describes conveyor-type washers, mono-rail-type conveyor washers, rotary drum washers, sheet steel washers, automatic spray washers, agitating washers, automatic coating machines, automatic phosphatizing machines, drying and paint ovens, paint spray booths, and a number of other machines. A discussion of complete custom-built finishing systems is also included. To obtain a copy write Dept. MPM, Metal Processing Dept., Pennsalt Chemicals Corp., 3 Penn Center, Philadelphia 2, Pa. In Canada, write Dept. MPM, Pennsalt Chemicals of Canada, Ltd., Oakville, Ontario.

Liquid Lock for Metal Parts

Loctite Sealant, which reportedly makes ordinary fasteners into lock fasteners at savings of 40 to 70 per cent, is fully described in a new bulletin. According to the manufacturer, Loctite Sealant gives locking action which extends over the entire engaged area, providing unequalled resistance to vibration. Treated parts may be disassembled with ordinary tools. Along with a detailed technical description of the sealant, the booklet presents several case histories and instructions on the use of the product. To obtain the bulletin, write Dept. MPM, American Sealants Co., Hartford 6, Conn.

Direct-On Porcelain Enameling

A technical brochure on the techniques and advantages of direct-on porcelain enameling, incorporating the Ray-Davis process, is now available. The brochure explains how, according to the manufacturer, this process can double oven capacity, cut handling, and obtain a better, more flexible porcelain coating. For a copy of the brochure write Dept. MPM, Chas. Pfizer & Co., Inc., Chemical Sales Division, 630 Flushing Ave., Brooklyn 6, N. Y.

Manual Welding Equipment

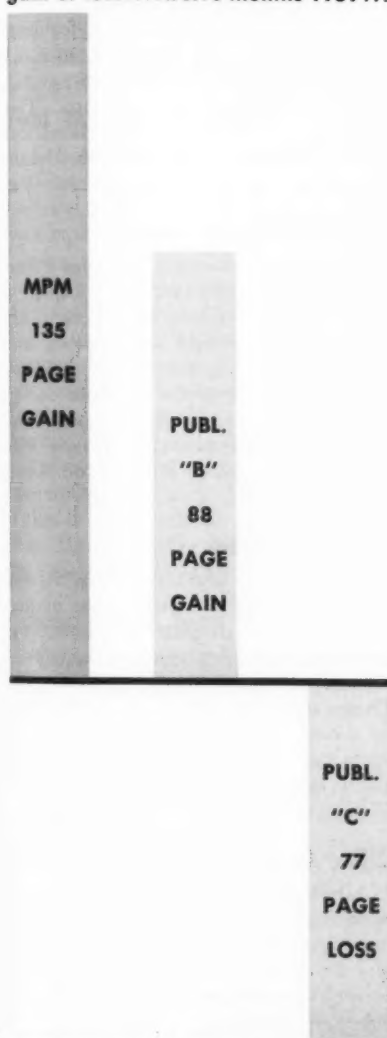
The Heliarc line of manual welding equipment is fully covered in a new 20-page catalog. Every manual torch in the line is clearly illustrated in one-half actual size. Accessories available for each torch are described in the torch section of the catalog, and are also listed separately in handy table form.

to Page 78 →

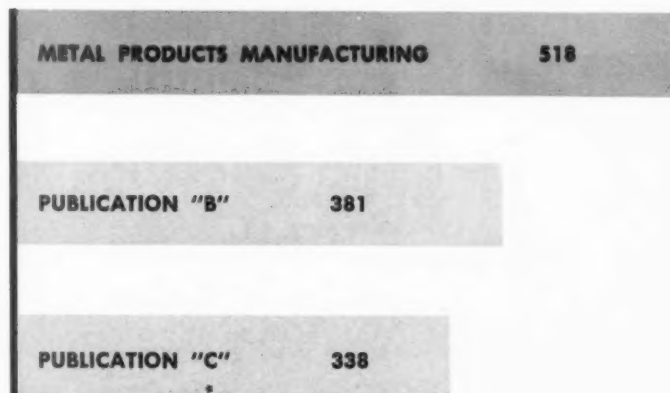
to sell manufacturers of appliances

note these facts about 3 publications serving the appliance OEM

total page ADVERTISING
gain or loss... twelve months 1959...



total pages EDITORIAL . . . twelve months 1959 . . .



*Adjusted to standard page size for eight months

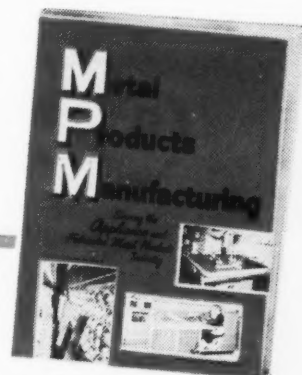
Since the inception of METAL PRODUCTS MANUFACTURING as a magazine in 1944, it has always carried a higher percentage of editorial content than other publications in the metals field. This is clearly demonstrated, in connection with publications serving the appliance industry, by the accompanying chart.

Quantity is one thing; quality is another. MPM spares no expense to prepare staff processing and engineering features procured in plants from coast to coast. Based on the best possible industry sources, these features are illustrated for the most part with exclusive MPM staff photos.

MPM is the one publication serving the appliance industry that gives complete staff coverage of the industry's important meetings, highlighted with exclusive photos by our own photographers.

This devotion to the basic reason for any publication to be in business — editorial service — is getting recognition in advertising circles, as well as by MPM readers, throughout the appliance and fabricated metal products industry. This recognition is spelled out in the advertising page gain charted on this page.

You can sell the appliance industry most effectively and most economically through the pages of MPM . . . THE BASIC BUY.



The only publication serving appliance OEM with 100% verification of circulation under BPA audit regulations . . .



Metal Products Manufacturing
Dana Chase PUBLICATIONS, INC.
Established 1944
YORK STREET at PARK AVENUE • ELMHURST, ILLINOIS
Telephone 4-5280, 5281

Modernized finishing

→ from Page 31

Armstrong found it necessary to lease two outside warehouses.

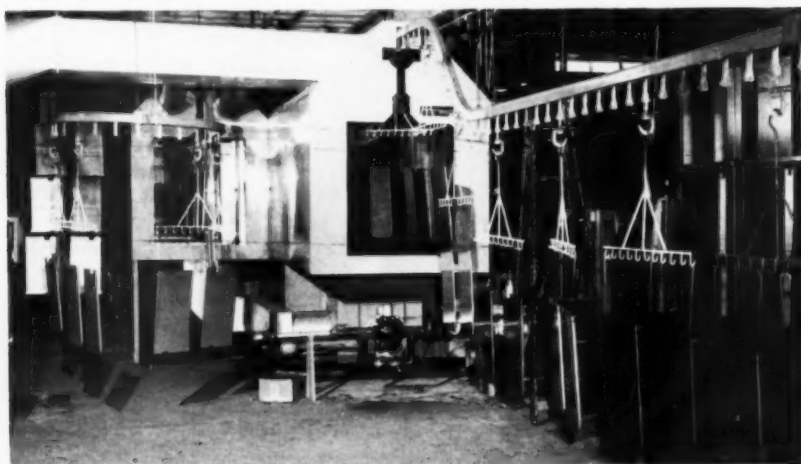
The finishing system has been modernized to include loading of the conveyor adjacent to the welding department. Completed assemblies now pass through a new three-stage unit, where they are washed, phosphatized, and moved through a gas dryer.

The conveyor then continues into the finishing department on the floor above

where the parts are pre-retouched as required and painted electrostatically by means of a disc-type unit. The electrostatic layout consists of a unique double loop, designed to allow altering loop size to include a wide range of part sizes.

After parts leave the sprayer, they move directly to the drying tunnel where they are baked in a combination electric and gas infra-red oven. The conveyor then passes through the assembly storage area for unloading prior to return to the first floor loading area.

The new metal washer is shown with parts moving into the washing section.



New Literature

→ from Page 76

According to the manufacturer, the welding equipment described is suitable for manual welding of all commercial metals, ranging from thin-gages to 1/2-inch thick. For a copy of the catalog write Dept. MPM, Linde Co., 420 Lexington Ave., New York 17, N. Y.

Anodizing Aluminum

Twenty-two questions and answers concerning the anodizing of aluminum are presented in a recently published booklet. Some of the topics covered in "Questions and Answers about Anodizing" are the cost of anodizing, forming of anodized parts, heat resistance of anodized parts, and the effect of anodizing on the dimensions of parts. The booklet is available on letterhead request from Dept. MPM, Reynolds Metals Co., Dept. PRD-26, Richmond 18, Va.

Hydraulic Shears Catalog

An eight-page bulletin describes a line of hydraulic shears ranging in capacity from 8 feet of 3/4-inch mild steel to 12 feet of 1 1/2-inch mild steel. Shown are typical models, specifications, descriptions and illustrations of features of design and construction. Copies are available from Dept. MPM, Verson All-steel Press Co., 9300 S. Kenwood Ave., Chicago 19, Ill.

Isolater Bulletin

A descriptive sheet has been issued on a series of isolaters which, the manufacturer claims, eliminate the "sounding board" effect, improve product performance, and lengthen equipment life. Photos and diagrams show applications of the isolaters and charts show load capacities. For a copy write Dept. MPM, Barry Controls, Inc., 700 Pleasant St., Watertown, Mass.

Office Furnishings

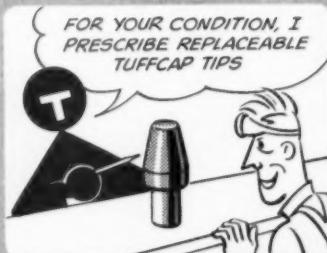
A new 80-page catalog shows a complete line of office furnishings. Aiding the office planner are decorator-inspired layouts in full color. Information given on each item includes dimensions, weight, colors, materials and price. For a copy write Dept. MPM, Cole Steel Equipment Co., Inc., 415 Madison Ave., New York, N. Y.

Flame-Cutting Machine

The newest addition to a line of flame-cutting machines is described in a recently published catalog. Designated the Linagraph, the machine is of pantograph design and is suitable for straight-line

DOC TUFFY

TO THE RESCUE



Mushroomed spotweld tip? Don't throw it away! Toss out the worn end . . . re-use the shank! You can when you use replaceable TUFFCAP TIPS and long-life TUFFALOY SHANKS.

Get the Tuffaloy Catalog and Price List. Write or call your nearest Airco or Tuffaloy office.

TUFFALOY



AIR REDUCTION SALES COMPANY

A division of Air Reduction Company, Incorporated
150 East 42nd Street, New York 17, N. Y.
Air Reduction Pacific Company • Air Reduction Canada Limited

and shape cutting on eight-foot steel plate used in medium-duty production. The liberally illustrated catalog explains the principal features of the unit such as centralized operator control, pantograph design, motorized torches and its adaptability to various tracing devices. For a copy write Dept. MPM, Air Reduction Sales Co., 150 E. 42nd St., New York 17, N. Y.

Automatic Drilling and Tapping

Technical data on operation and selection of automatic drilling and tapping units is contained in a recently released catalog. Also featured are the various uses to which these units can be adapted. For a copy write Dept. MPM, Hypneumat, Inc., 647 W. Virginia St., Milwaukee 4, Wis.

Fuel Burning Equipment

A new 12-page illustrated catalog showing a complete line of commercial and industrial fuel burning and auxiliary equipment has been announced. An "Index and Selection Chart" simplifies selection of appropriate equipment for any application.

Discussed are the entire line of commercial-industrial oil burners, gas burners, dual-fuel burners for gas and oil, forced draft package units, boiler-burner units, coal stokers, factory-wired combustion control panels and a steam-heating system. For a copy of Form 6260 write Dept. MPM, Iron Fireman Manufacturing Co., 3170 W. 106th St., Cleveland 11, Ohio.

Screw Thread Form

The Hi-Life thread, a recent development in industrial fasteners, is the subject of a four-page folder. Through the use of photoelastic studies the new literature depicts the change from the old flat-root thread form to Hi-Life's controlled thread root form which features a larger and more uniform root radius of concave configuration. For a copy of the folder write for Unbrako Hi-Life, Box 1089, Standard Pressed Steel Co., Jenkintown, Pa.

Safety Manual and Films

The National Safety Council has announced the availability of a new accident prevention manual and a series of four training films on the subject, "Communication for Safety."

"Accident Prevention Manual for Industrial Operations" is a completely revised volume containing more than 500 illustrations and 1,543 pages of up-to-the-minute data on every aspect of industrial safety. The four films are

METAL PRODUCTS STATISTICS

	1959 (Units)	1958 (Units)	% Change
Gas-Fired Furnaces.....	November 87,100	85,400	+ 2.0
	Jan.-Nov. 987,900	788,100	+25.4
Gas-Fired Boilers.....	November 11,100	10,000	+11.0
	Jan.-Nov. 129,600	115,900	+11.8
Gas Conversion Burners.....	November 14,300	9,500	+50.5
	Jan.-Nov. 148,900	135,200	+10.1
Oil-Fired Central Heating	October 87,168	79,295	+ 9.9
Equipment.....	Jan.-Oct. 525,502	472,476	+11.2
Gas Ranges, Free-Standing....	November 139,800	148,500	- 5.9
	Jan.-Nov. 1,550,800	1,508,500	+ 2.8
Gas Ranges, Built-In.....	November 33,700	22,600	+49.1
	Jan.-Nov. 323,000	206,900	+56.1
Gas Water Heaters.....	November 192,600	197,100	- 2.3
	Jan.-Nov. 2,756,400	2,466,100	+11.8
Gas Vented Recessed Wall	November 41,300	38,200	+ 8.1
Heaters.....	Jan.-Nov. 412,800	353,800	+16.7
Gas Floor Furnaces.....	November 8,800	7,700	+14.3
	Jan.-Nov. 94,400	92,200	+ 2.4
Gas Direct Heating Eqpt.....	November 164,300	141,500	+16.1
	Jan.-Nov. 1,401,800	1,305,500	+ 7.4
Gas Unit Heaters & Duct	November 17,200	13,400	+28.4
Furnaces.....	Jan.-Nov. 144,500	119,300	+21.1
Gas Incinerators.....	November 3,700	4,600	-19.6
	Jan.-Nov. 41,900	45,300	- 7.5
Electric Household Refrig-	November 265,900	245,500	+ 8.4
erators.....	Jan.-Nov. 3,502,400	2,829,800	+23.1
Electric Farm & Home	November 64,900	91,300	-29.0
Freezers.....	Jan.-Nov. 1,142,200	1,035,300	+13.2
Electric Ranges, Free-Standing..	November 72,500	73,600	- 1.5
	Jan.-Nov. 854,000	725,000	+17.8
Electric Ranges, Built-In.....	November 71,500	55,500	+28.8
	Jan.-Nov. 685,300	484,700	+41.4
Electric Water Heaters.....	November 29,100	65,100	-55.3
	Jan.-Nov. 716,300	754,900	- 5.1
Electric Dishwashers.....	November 61,100	42,000	+45.5
	Jan.-Nov. 510,600	369,200	+25.7
Electric Food Waste Disposers..	November 65,000	59,400	+ 8.6
	Jan.-Nov. 699,300	548,700	+21.5
Combination Washer-Dryers....	November 16,482	17,725	- 7.0
	Jan.-Nov. 181,834	146,713	+24.0
Washers—Automatic & Semi..	November 243,248	259,335	- 6.0
	Jan.-Nov. 2,718,735	2,512,989	+ 8.0
Washers—Wringer & All	November 69,548	73,700	- 6.0
Other.....	Jan.-Nov. 850,405	828,840	+ 3.0
Electric Dryers.....	November 98,786	98,972	-
	Jan.-Nov. 818,663	722,796	+13.0
Gas Dryers.....	November 58,261	43,527	+34.0
	Jan.-Nov. 428,479	330,732	+30.0
Vacuum Cleaners.....	November 290,130	293,609	- 1.2
	Jan.-Nov. 3,127,012	2,978,082	+ 5.0
Metal Furniture.....	November *	*	+10.0
	Jan.-Nov. *	*	+ 6.0
†Television.....	November 560,770	437,772	+21.9
	Jan.-Nov. 5,756,210	4,505,578	+21.7
†Radio (1).....	November 1,346,079	1,438,061	- 6.4
	Jan.-Nov. 14,069,049	10,342,833	+36.2
Compressor Bodies (2).....	June 497,692	333,642	+49.1
	Jan.-June 3,080,560	2,139,885	+44.0
Steel Barrels & Drums.....	October 2,114,428	2,776,749	- 8.0
	Jan.-Oct. 28,183,436	26,434,591	+ 6.6
Steel Pails.....	October 6,154,761	6,227,215	- 1.0
	Jan.-Oct. 69,152,269	62,108,348	+11.3
Typewriters.....	November 117,144	*	*
	Jan.-Nov. 1,141,451	*	*
Unitary Air Conditioners (3)...	Jan.-Sept. 234,444	*	+47.0
Heat Pumps.....	Jan.-Sept. 25,834	*	+108.0

(1) Including auto receivers (2) Except for household refrigerators

(3) Including heat pumps * Not reported

† Output — all other figures are factory shipments or factory sales

Sources for this information: Gas Appliance Manufacturers Association, National Electrical Manufacturers Association, American Home Laundry Manufacturers Association, Vacuum Cleaner Manufacturers Association, National Association of Furniture Manufacturers, Electronic Industries Association, Air-Conditioning and Refrigeration Institute, and U.S. Dept. of Commerce.

COMING FEATURES

DESIGN

WESTINGHOUSE FOOD WASTE DISPOSER WITH SHOCK ABSORBER MOUNTING
WHAT TO LOOK FOR IN FUTURE APPLIANCE DESIGN
DESIGNING A COMPLETELY NEW GAS REFRIGERATOR

FABRICATION

AUTOMATED FABRICATION AT HOTPOINT'S REFRIGERATOR PLANT
SPEED FORMING PRE-PLATED LAWN MOWER HANDLES
NEW DIE FORMS ANY ANGLE TO SIXTY DEGREES
FABRICATING AT AVONCRAFT DIV., AVONDALE MARINE WAYS, INC.
NAMEPLATES WITH FLAME-CUT LETTERING

FINISHING

PORCELAIN ENAMELING AT AVONCRAFT DIVISION
ENAMELING FURNACE HAS WIRE MESH BELT
PRODUCTION FINISHING ALUMINUM SIDING
FINISHING WATER HEATER PARTS AT HOTSTREAM

GENERAL

SPECIAL SECTION — MAY — THE COMPLETE BUSINESS, ENGINEERING AND PRODUCTION STORY OF ONE OF THE COUNTRY'S LEADING MULTI-PRODUCT APPLIANCE MANUFACTURERS — KELVINATOR
"RELIABILITY" — THE FUTURE WORD FOR PRODUCT DESIGNERS
SPRAYABLE URETHANE FOAMS
VOLUME PRODUCTION OF PORTABLE ROOM HEATERS
MASTER SLAVE PROGRAMMING
NEW FREON-SONIC ENERGY CLEANING SYSTEM
AN EXCLUSIVE INTERVIEW FEATURE ON CURTAIN WALL CONSTRUCTION
SPECIAL SECTION — JULY — THIRD ANNUAL SECTION DEVOTED TO AUTOMATIC MERCHANDISING INDUSTRY (COIN-OPERATED MACHINES)

NEWS

MONTHLY STATISTICAL REVIEW
STAFF EDITORIAL AND PHOTO COVERAGE OF ALL IMPORTANT INDUSTRY MEETINGS

New Literature

→ from Page 79

described by the Council as a "fresh, realistic solution to the ever-present problem of communication. Here's a proven plan to get your supervisors and foremen to communicate — for safety's sake!" Complete information on the films and the safety manual may be obtained from Dept. MPM, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

AWS Comparison Charts

"The most complete set of welding rod and electrode comparison charts ever published," have been announced by the American Welding Society. The 8½ x 11-inch, 48-page booklet covers 15 AWS-ASTM specifications and brands as well as manufacturers names contained in two indexes. Previously, AWS says, it was difficult for a user of welding materials to determine the exact classification of a branded filler metal. With the aid of the Comparison Charts it is possible to see at a glance in which classification a filler metal belongs, irrespective of the brand name or number. Copies may be obtained at a list price of \$2.50 from Dept. MPM, American Welding Society, Dept. T., 33 W. 39th St., New York 18, N. Y.

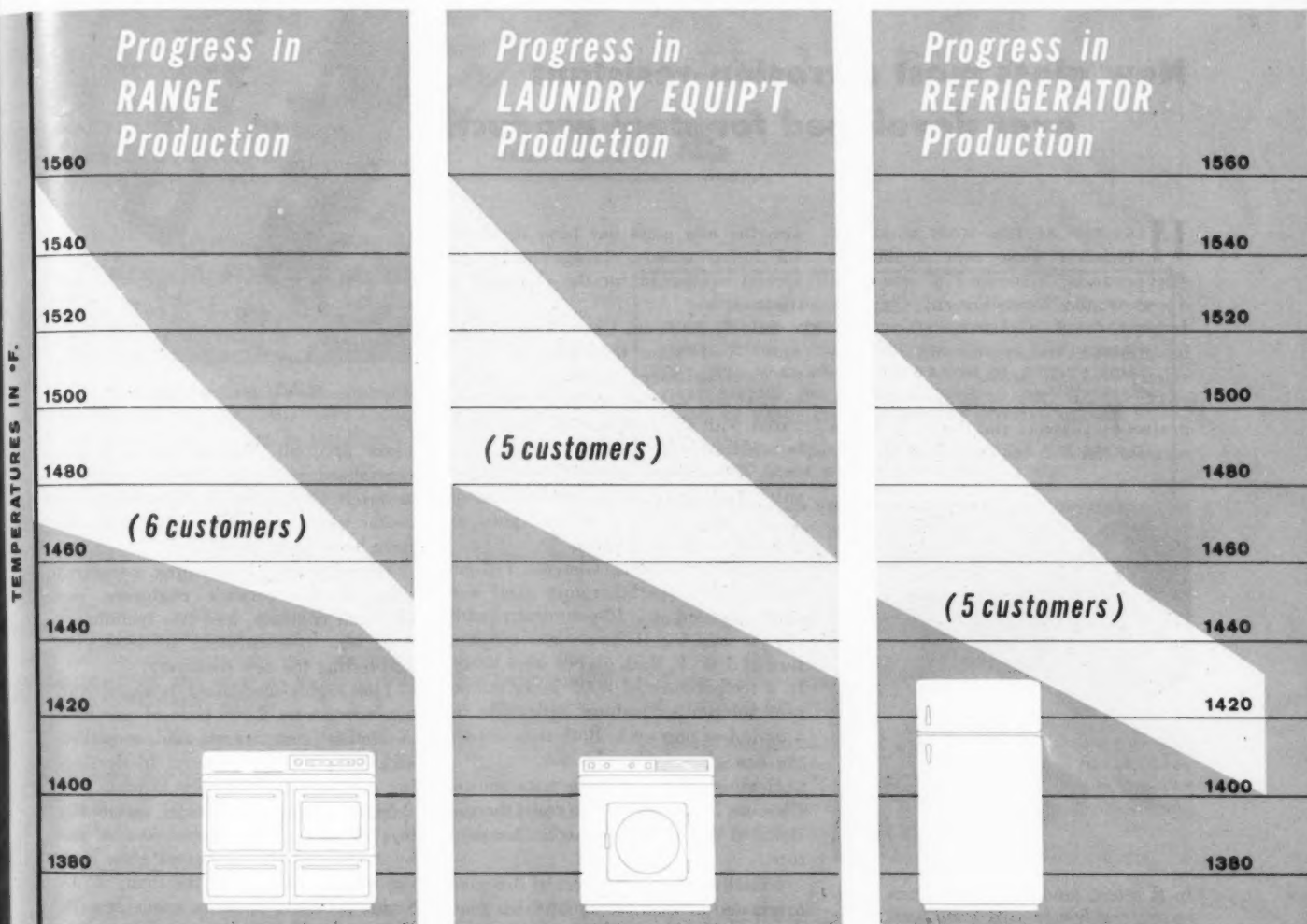
Crane and Hoist Catalog

A full line of hoist products for overhead handling of loads from ¼-ton through 60 tons is described in a new catalog. Covering more than 20 different kinds of cranes, hoists, and specialty and accessory items, the 12-page illustrated catalog is said to contain equipment meeting virtually every overhead handling requirement encountered in the metalworking, machinery, electrical manufacturing, chemical, utility, and other industries. To obtain a copy write Dept. MPM, The Harrington Co., Plymouth Meeting, Pa.

Conveyor Systems Booklet

A booklet on conveyor systems titled "Creative Engineering Dares to Challenge Tradition" is now available. It describes service available, with installation pictures of special machines, automotive transfer and automation equipment designed and manufactured by the company. Also illustrated is standard piano hinge metal belt developed primarily for removal of metal turnings and chips from machine tools and also used for other material handling conveying purposes. For a copy of the booklet write Dept. MPM, Jorgensen Conveyors, Inc., 6208 N. 38th St., P.O. Box 156, Station F, Milwaukee 9, Wis.

Firing Temperatures are coming DOWN



Can FERRO'S production-proved LOW-TEMP enamels improve your operations, your profits?

Quietly, without fanfare, a minor revolution has taken place in the porcelain enameling industry this past year. Accelerated in part by critical steel supplies, lower temperature enamels have come into wide use. Firing temperatures are down—in some instances *more than 100 degrees*—without any loss in quality or production volume.

The change-over in most cases has been smooth, relatively simple. Reason for this, of course, is that Ferro's LOW-TEMP enamels have been in limited use for years,

have been production-proved over a long period of time, and only needed to be "adapted" to each customer's plant facilities and production requirements.

Both ground-coats and cover-coats are available, some of the latter with smelted-in color. All are easily workable, with properties comparing favorably with higher temperature enamels.

May we tell you more about them, show you how you can profitably use them in *your* operations?



FERRO CORPORATION

4150 East 56th Street • Cleveland 5, Ohio
Nashville 11, Tenn. • Los Angeles 39, Calif.

New glass most corrosion-resistant ever developed for steel products

HERALDED AS THE MOST corrosion-resistant glass ever applied to steel products, "Glascote 778" was introduced at the Exposition of Chemical Industries at the Coliseum in New York by Glascote Products, Cleveland, a subsidiary of A. O. Smith.

The result of a three-year research project by Glascote and the A. O. Smith ceramic research laboratory in Milwaukee,



In this test, laboratory technician is inserting test bombs used in oil bath under high pressure for checking corrosion of glass.

kee, the new glass has been developed for lining vessels, storage tanks, and special equipment for the chemical industries.

Said S. R. Stout, Glascote sales manager, "Tests show that Glascote 778 is the most corrosive-resistant glass applied to steel ever developed. Even when compared with the toughest of them all — boro silicate-type laboratory glass, Glascote 778 showed greater resistance to sulphuric, nitric, and hydrochloric acids. At the same time, it showed good resistance to thermal shock."

In the actual tests, Glascote 778 and boro silicate-type laboratory glass were each exposed to 10-per cent hydrochloric acid for 16 hours at a temperature of 350° F. Both glasses were heated to a temperature of 200° F. in 0.5-per cent solution of sodium hydroxide for a period of one week. Both tests showed the new glass to be superior.

Heating and quenching tests showed Glascote 778 better able to resist thermal shock at a significantly-higher temperature.

Initially, the development of this glass originated at Glascote about three years ago. At that time, Glascote was doing much of its own research. About two



Alkali test samples.

years ago, all Glascote research was centralized at the A. O. Smith ceramic research laboratory in Milwaukee — a center where over 3,500 glass formulae have been investigated.

During the past 18 months, a research team of five ceramic engineers, one chemical engineer, and two technicians have been concentrating on developing and testing the new discovery.

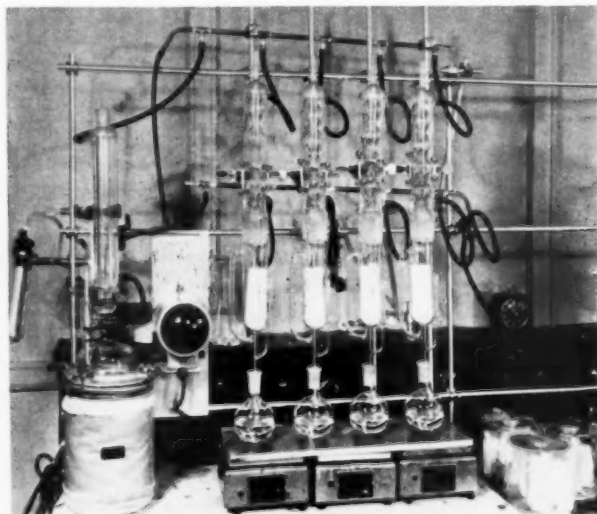
This highly-specialized research staff conducted over 2,500 tests of one kind or another (composition, acid, corrosion, alkali, thermal shock, etc.) in developing and proving their new formula.

Since a glass is tailored specifically to resist the environments encountered by each product, a different glass coating is used on each of the many A. O. Smith products such as water heaters, Harvestore, beer tanks, and chemical reactors.

Typical spray booth and laboratory furnace at A. O. Smith.



View of extractor setup (below) for surface finish evaluation.



THE Finish LINE



A REAL JOB FOR PLUMBERS . . .

is represented by the two words "public relations," and one that will certainly bring to mind the old axiom, "Actions speak louder than words."

A recent release from the Plumbing-Heating-Cooling Information Bureau gave some very sound advice, so we will quote part of this release in the Finish line.

"We hear a lot about public relations nowadays — about how important it is for an industry to enjoy good relations with the public.

"That's true. And it applies to our industry. In fact, it is *definitely true* of our industry.

"There is nothing mysterious about public relations. When you come right down to it, all it means is that the public should appreciate what an industry does, how important it is, and what its products will do for better and more comfortable living.

"How can we have better public relations?"

"That's not too difficult.

"We can have better public relations if everyone in the industry will do his part to make the public think well of us.

"Everyone in the industry?"

The PHCIB goes on to point out that the truck driver for a wholesaler, the voice on the telephone for the plumbing-heating-cooling contractor, the journeyman, the apprentice, and the contractor himself all have a part to play in developing good or bad public relations for the Plumbing-Heating-Cooling industry. With all these points we heartily agree, but on the basis of three case histories, we say there's a mighty big job to be done in that particular industry.

One-half inch pipe

A friend of mine built a home about twenty years ago. He had a meticulous architect and a conscientious general contractor, so he depended on his architect for plans and on the general contractor for supervision. Unfortunately, the general contractor was overly trustful of his subs.

The specifications called for three-quarter inch pipe throughout the house, but when the owner dropped in one day after the piping was all in and covered with walls, he found that one-half inch pipe had been supplied. Should he have the walls torn down and the pipe replaced, or take it with a smile?

Eighty dollars extra

This same man decided to put in a second bath, just a few years ago, so he called on another plumbing contractor, got information on fixtures, selected them, had prices

"WHEN YOU FACTOR THE COST OF TODAY'S RECEIVER INTO ITS LIFE EXPECTANCY OF ABOUT TEN YEARS AND CONSIDER THE AVERAGE VIEWING TIME OF FIVE HOURS A DAY, YOU GAIN SOME APPRECIATION OF WHY TV RANKS FIRST AMONG ALL OTHER HOUSEHOLD APPLIANCES IN TERMS OF VALUE RECEIVED FOR THE INVESTED DOLLAR. . .

"TEN YEARS FROM NOW WE MAY WELL LOOK BACK AT 1959 AND JUDGE OUR SETS TODAY AS 'CRUDE'."

from a statement by Herbert Riegelman, general manager of General Electric's television receiver department.

noted on the literature, and asked for a firm price on installation.

There was no request for a cut price, or for anything but list prices on the fixtures.

When the plumber's bill came through, there was an \$80.00 added charge, "without explanation." Should the home owner fight for \$80.00, and take a chance on the plumber placing a lien on his paid-for home, or should he accept the charge?

The leaky valve

The same home owner purchased a sparkling new washer and dryer just a couple of months ago, and through the dealer he contracted with a third local plumber to pay a sum of \$75.00 for putting in a couple of valves and pipes for the washer and the gas piping and exhaust outlet for the dryer.

In this case, everything works, except the two valves at the washer which are so tight that a man must use both hands to turn them, and one of them leaks. Calls to the plumber get the hearty response that it will be fixed, but after several weeks, the water still drips.

This is not presented as a survey report, but as the experiences of a single individual in relation to his dealings with plumbing contractors; not just one, but three different men.

You can imagine it will take a great deal of "public relations" on the part of the plumbing-heating-cooling industry to convince a homeowner who has had this kind of experience, that he is actually dealing with a very fine industry composed of fine businessmen who are interested in the general welfare of the buying public.

Dana Chase
EDITOR AND PUBLISHER



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 York Street at Park Avenue
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editorial voice of the national safe transit program

devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.

Certification Lists Increase

Fourth quarter certification lists reflect an increase since they were published a year ago. Manufacturer certifications have jumped from 104 to 162, with laboratories showing an increase from 63 to 70. Pledges are already being received from laboratories planning certification in 1960.

Certified Products Register

Continued high interest in the Certified Products Register is indicated by its growth from 16 pages in the first edition to 20 pages in the just-published second edition. The CPR emphasizes to the carrier that each product listed has been subjected, when packaged for shipment, to standard pre-shipment tests on a regular basis, and that each packaged product is identified by a Safe Transit label.

Copies of the Certified Products Register are available at 25 cents per copy by writing to National Safe Transit Committee, Inc., 1145 Nineteenth St., N. W., Washington 6, D. C.

Carloading Check Chart

Freight carloading check charts for wall-anchored, free-floating, and controlled-floating loads are being offered by Signode Steel Strapping Co. They are designed to assist shipping room and loading dock personnel in the proper way to clean, drape strapping, and load boxcars. They provide clear, simple methods on carloading procedure for these types of loads.

For your free copy of these aids to freight carloading practices, write to Dept. MPM, Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.

Tech. Services Advisory Council

The National Safe Transit Committee recently appointed three industry representatives to serve as the nucleus of its new Technical Services Advisory Council. Heading the new group is P. W. Bush, Westinghouse Electric Corp.,

and director of NSTC's Technical Services Division. Assisting in planning the initial formation and future operations are A. W. Gaulke, Package Development Corp., and W. L. Newman, General Electric Co.

Functions of the new council will be

AAR Poster Emphasizes Teamwork

Bright red and yellow posters stressing damage prevention through Teamwork with the National Safe Transit Committee have been released to more

than 250 railroads in the U. S. and Canada. The new poster is one of a bi-monthly series on damage prevention which is distributed by the Freight Loss & Damage Section, Association of American Railroads.

*All manufacturing,
 engineering,
 and quality efforts
 are in vain
 if the product
 reaches its
 destination in a
 damaged condition.*

HANDLE FREIGHT WITH CARE *Everywhere!!*

SAFE TRANSIT TAKES TEAMWORK



PREPARE FOR PREVENTION

SHIPPERS
RAILROAD MEN

PRACTICE PERFECT SHIPPING EVERY DAY

to serve as a clearing house for technical information and developments affecting the manufacturing and shipping industry, to maintain technical liaison with each of the industry areas involved, and to provide continuing research for new technical developments in the packaging, materials handling, and transportation fields.

Gilbert W. Chapman, president of The Yale & Towne Mfg. Co., has announced the retirement of Elmer F. Twyman as senior vice president and the assignment of his responsibilities for all the company's domestic and foreign materials handling equipment operations to John A. Baldinger, vice president.

Heat pump controls

→ from Page 23

single-throw and is connected in the circuit leading to the compressor motor. In either case, normal compressor operation is resumed when the evaporator defrost control senses the rise in evaporator temperature after the removal of the ice.

Humidity Control

Additional convenience is afforded the user if the fan can adjust its speed automatically in response to room air temperature (Fig. 7). Under conditions of high relative humidity and relatively cool outside temperature, the unit will quickly satisfy the thermostat and run only for short periods. Little moisture is removed from the air under such short cycling conditions, and the cold, damp air delivered to the room produces a "clammy" feeling. Thermostatic fan speed control counteracts this result by lowering the cooling capacity and increasing the dehumidifying capacity of the unit through a reduction in fan speed with continuing compressor operation. For a three-speed fan, a three-stage control is available.

However, reduced air flow at low temperatures may tend to ice up the evaporator. In this case, the evaporator defrost control shown in Fig. 6 can be included in the system.

In the heating phase of the cycle, it is desirable to maintain high fan speed. This feature can be obtained by using a three-stage control and a selector switch (Fig. 8). In this arrangement, the fan is always at high speed in the heating phase, regardless of temperature.

This article touches on only a few of the combinations of heat pump controls that can be employed. Future innovations will increase the efficiency of the heating-cooling unit and strengthen the position of the appliance in the industry.

MEET THE MAN FROM WIREBOUND



At Ingersoll-Humphries Div., Borg-Warner Corp.

Wirebound protective crates pack 50% faster... ship for less!

In the Mansfield, Ohio plant of Ingersoll-Humphries Div., Borg-Warner Corp., a Crate Making Department was kept busy supplying special wooden boxes for shipment of the quality enameled cast iron plumbing fixtures that have made this company famous.

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Why not discover what the Man from Wirebound can contribute to your packaging operation? He is a qualified packaging engineer... happy to study your methods... offer money saving suggestions... submit samples for you to test. There's no obligation or cost.

Send for Free informative booklet, "What to Expect from Wirebounds"

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MANUFACTURERS ASSOCIATION
Room 1461 222 West Adams St., Chicago 6, Ill.

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Strippable Coating for Metal Protection

Dependable, inexpensive protection for the surfaces of metal during and after forming operations is provided by a stripable coating called "Plastisol Clear." It is a polyvinyl chloride resin dispersion in a plasticizer.

The film formed by the material is formulated to safeguard metal against corrosion and marring during metal forming processes, and to remain in place during highly-stressed drawing and punching operations.

The film may be easily removed after operations are completed, or the material may be left on metal parts for removal by the ultimate user to eliminate marring or finger marking during transportation to the point of use.

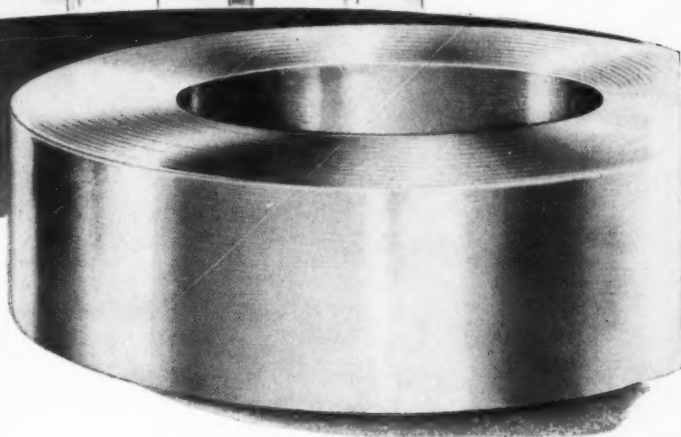
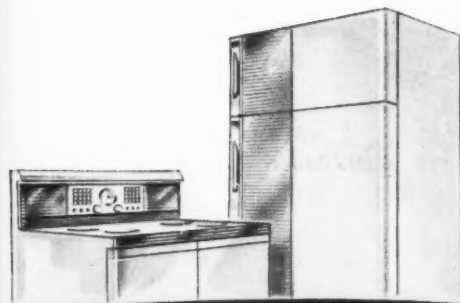
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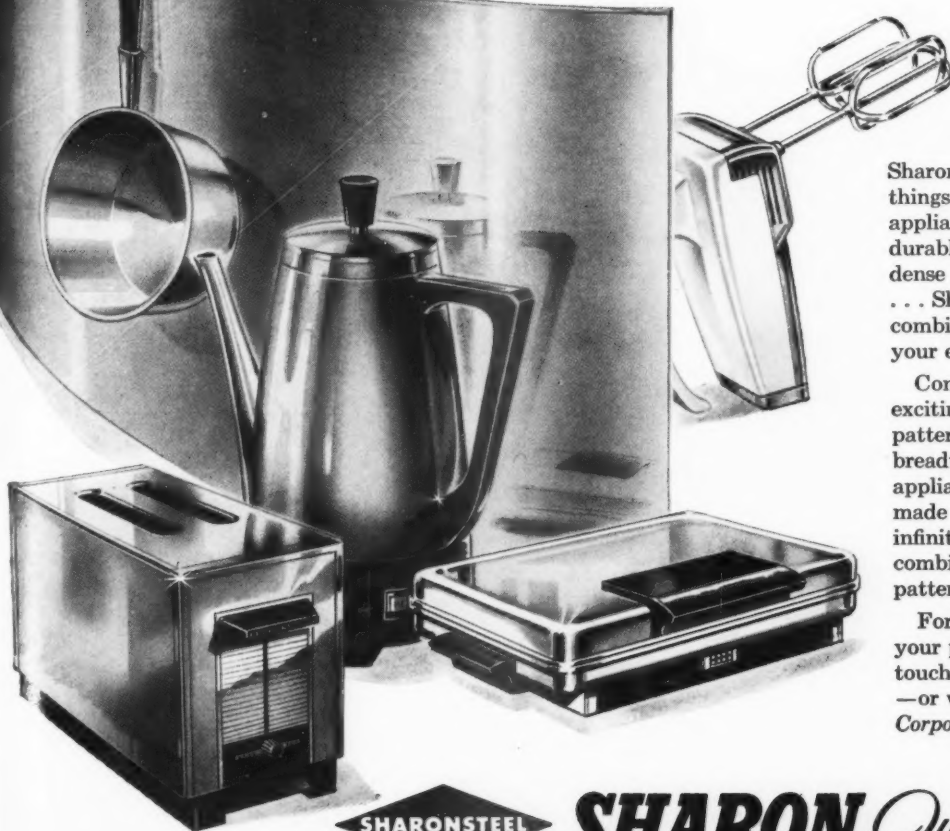
For further information, contact Dept. MPM, The Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland, Ohio.



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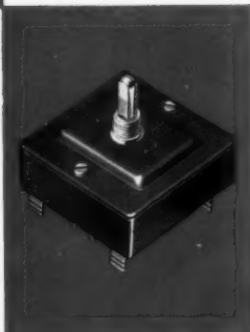
2 TOGGLE SWITCHES

The unusual simplicity of the new TEP Toggle Switch design achieved by Tuttle Research Engineers, now provides a dependable, top-quality switch at lower cost. Considerably smaller than comparative switches offering the same variety of contacts, it includes provisions for four-way wiring connections. There are only 11 working parts, and the complete switch weighs less than one ounce.



3 HEAT SELECTOR SWITCHES

Series 3000 rotary snap-type switches, also manufactured by TEP for electric ranges, air conditioners, space heaters and related applications, feature positive, trouble-free contact action and 7-heat selection. They are available either with or without a pilot light and with different shafts and handles to suit your needs. Write today for sample and quotation.



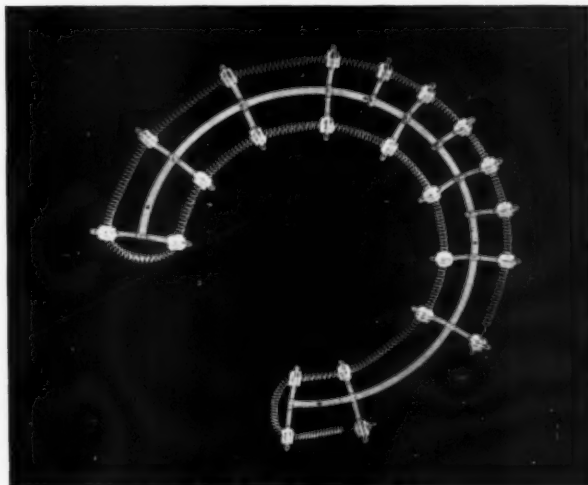
4 TUBULAR HEATING ELEMENT

This element is ideal for a wide range of applications. It's highly efficient in heat guns, hair dryers, space heaters, hot food vendors, photo print dryers, and other products where air is to be heated while flowing through a tube or nozzle. It can be controlled thermostatically and furnished in ratings from 500 to 2000 watts at 115 or 220 volts.



For Appliance and Related Applications

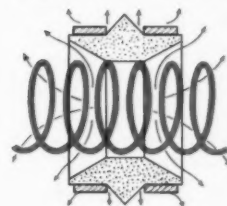
Here is the present line of Tuttle products designed to help you manufacture better electrical products. New in the group are the single position infinite control and the tubular heating element. The Single Position Infinite Control was formerly manufactured and sold by Tuttle & Kift, Inc., and we are pleased to announce our acquisition of the manufacturing and sales rights to this highly efficient control. The Tubular Heating Element was recently designed by us for use in hand dryers. It has many other possible uses. We would welcome the opportunity of working with you on any of your problems involving any one or more of these, or other electrical products. Merely call or write.



5 OPEN COIL HEATING ELEMENTS

The design and manufacture of "open coil" heating elements has long been a major TEP service to the appliance industry. TEP has designed and developed many new and exclusive features, such as the one illustrated with diamond shaped insulators. Call or write today for TEP design and engineering assistance on any job. There is no obligation.

Cross-sectional view of new TEP insulator and cross-bar design. More space for air circulation assures better heat dissipation, longer wire life.



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